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Complement Fixation in Tuberculosis.—The Besredka complement-fixation reaction was used on 200 cases, and of these 145 were studied clinically. The tests were made in two different laboratories and with three different antigens, namely, tubercle bacilli in egg medium, tubercle bacilli washed free from egg medium and suspended in salt solution, and a methyl-alcohol extract according to Boquet and Nègre. As complement, one and one-half times the titre dose was used, since tuberculous sera can be anticomplementary. The method is highly specific, but is not sensitive enough for practical purposes.—*Die Besredkasche Tuberkulosereaktion. Erfahrungen aus einer Tuberkulosefürsorgestelle in Moskau, I. Mitt., W. Wariszewew and Selma Jakubowitsch, Centralbl. f. Bakt., 1925, xlv, 402.*—(*H. J. C.*)

Complement Fixation in Tuberculosis.—The Wassermann reaction for tuberculosis was found to give too great a percentage of erroneous results. In definite disease the complement-fixation reaction of Besredka proved valuable in diagnosis, but concerning activity it gave no information. With increasing intensity of the reaction the possibility of an active tuberculous process increases, when other diseases (syphilis, malaria and typhus fever) giving a positive reaction are excluded and if the case has not been previously treated with tuberculin. A positive Pirquet is an index of past infection, while a positive Besredka in advanced cases is an index of past disease.—*Zur klinischen Wertung der Komplementbindungsreaktion nach Besredka, E. Guth, Ztschr. f. Tuberk., 1925, xliii, 372.*—(*H. J. C.*)

Complement Fixation in Tuberculosis.—A method of preparing Besredka's antigen is described, which, it is claimed, increases the specificity of the reaction. Cultures on Besredka's medium, 2 to 3 weeks old, are killed by heating for 20 minutes at 110°, after which the bacilli are washed with salt solution until the supernatant fluid is clear. The bacilli are then shaken in an apparatus for 3 to 4 hours with salt solution, until a dense homogeneous suspension is obtained. The reaction itself is performed with slightly different details than given by Besredka. A large number of sera from healthy tuberculous and syphilitic persons, and from cases suffering from other diseases, were examined coincidently with the Wassermann antigen. The Wassermann reaction confirmed clinical findings in 50 per cent, the Besredka in 80 per cent. In the determination of active tuberculosis the Besredka reaction also gave a higher incidence. Healthy persons and those suffering from other diseases, especially children, often gave suspicious or positive reactions. These were more frequent with the Wassermann than with the Besredka reaction.—*Zur Serodiagnostik der Tuberkulose mittels Komplementbindung, II. Mitt., F. v. Gutfeld and Edith Weigert, Centralbl. f. Bakt., Abt. I., Orig., 1924, xciii, 436.*—(*H. J. C.*)

Complement Fixation in Tuberculosis.—In a previous study of the reaction there were reported 84 per cent positives among clinically tuberculous and 14 per cent among clinically nontuberculous persons. Further studies have been made and carefully checked with the other findings. The serological work was done in Calmette's laboratory at the Pasteur Institute, according to the technique of Calmette and Massol, using both the methylic antigen of Boquet and Nègre and Besredka's egg antigen. Wassermann tests were likewise done.

Group 1: Manifest open pulmonary tuberculosis: There were 44 positives among 50 patients (88 per cent), but 4 of these were 1+, and 20 were 2+. *Group 2: Clinically and radiologically tuberculous, but sputum negative:* There were 25 positives among 31 patients (83 per cent), but 3 of these were 1+ and 12 were 2+. *Group 3: Clinically nontuberculosis:* There were 5 positives among 42 patients (12 per cent), but none of them were more than 2+. It is concluded that the complement-fixation reaction is a valuable addition in the diagnosis of tuberculous affections.—*Sur la valeur de la réaction de fixation du complément dans la tuberculose, L. Bernard, M. Salmon, L. Baron and J. Valtis, Meeting, Section, d'études scientifiques de l'Oeuvre de la Tuberculose, March 14, 1925, reported in Rev. d. l. Tuberc., June, 1925, vi, 389.*—(*A. P.*)

Complement Fixation in Tuberculosis.—The Wassermann complement-fixation reaction for tuberculosis is not specific, for it yields positive results occasionally in meningitis, scarlet fever and other diseases. A negative reaction means nothing, for not uncommonly a patient with tuberculosis will give a negative reacion.—*Ueber die Serodiagnostik der Tuberkulose des Kindersalters mittels der Komplementbindungsreaktion von Wassermann, F. Szirmai and P. Venetianer, Wien. klin. Wchnschr., February 5, 1925, xxxviii, 169.*—(*H. S. W.*)

Complement Fixation in Tuberculosis.—Tubercle bacilli extracted with acetone and then taken up in distilled water make a good antigen for complement fixation in tuberculosis. The antigen prepared in this manner should be made from at least six different strains of human or bovine bacilli. The technique is given in detail and differs only in a few points from numerous standard methods.—*Zur Serodiagnostik der Tuberkulose, G. Blumenthal, Deutsche med. Wchnschr., May 23, 1924, l, 673.*—(*H. S. W.*)

Complement Fixation in Tuberculosis.—All complement-fixation methods yet advanced in tuberculosis have failed to stand up on careful analysis and repetition. With Wassermann's recent method it appears that things are different. It was used on 334 patients with pulmonary tuberculosis, lupus, scrofuloderma, surgical tuberculosis, tuberculosis and syphilis, etc. The results were not nearly as constant or as regular as one might have expected, nor were they positive in nearly as high a percentage in complement fixation for syphilis.—*Serologischer Nachweis der Tuberkulose, insbesondere mit dem Verfahren nach v Wassermann, S. Silberstein, Deutsche med. Wchnschr., May 23, 1924, l, 675.*—(*H. S. W.*)

Complement Fixation in Diagnosis of Tuberculous Exudates.—The Besredka complement-fixation reaction has proved valuable with serum as well as with puncture fluid, while cytological examination alone gives no conclusive information as to the nature of an exudate, but merely indicates the intensity and duration of the inflammation. The reaction of Besredka has proved to be specific for exudates. A positive complement-fixation reaction on puncture fluids certifies the diagnosis of tuberculosis in the body. The reaction on the serum of the same patient parallels that in the exudate and, in addition, the findings are in agreement with the bacteriological and cytological findings. Forty cases were examined, the majority being pleural exudates and a few being peritoneal and knee-joint fluids.—*Über die Komplementablenkungsreaktion bei Tuberkulose mit dem Antigen Besredka an Punktaten und ihre Bewertung im Vergleich zur bakteriologischen und mikroskopischen Untersuchung, K. Michailow, Ztschr. f. Tuberk., 1925, xliii, 191.*—(*H. J. C.*)

Value of Ambard Constant in Tuberculosis.—The Ambard constant (relation of blood urea to urine urea) is still too uncertain a method to be of value diagnostically for practical purposes. In tuberculosis its value and significance alone are slight.—*Die Methodik der Bestimmung der Ambardschen Konstante und ihre Verwertung bei Tuberkulose, H. Deist, Beitr. z. Klin. d. Tuberk., 1925, lxi, 391.*—(*H. J. C.*)

Red-Cell Sedimentation Reaction.—Reference is first made to previous studies of sedimentation from the prognostic standpoint, the results of which appear to show an almost constant parallelism between the rapidity of sedimentation of the red cells and the extent, activity, and especially anatomic form of the lesions. A table is constructed as follows: *Fibrous tuberculosis*, readings of 7 to 10 mm.; *fibrocaseous tuberculosis* (nodular and productive), 10 to 18 mm., *exudative tuberculosis* (bronchopneumonic and pneumonic), 19 to 22 mm., tuberculosis with cavity, 19 to 22 mm., and serous membrane tuberculosis, 18 to 22 mm. Among normal men the readings have been from 2 to 4 mm., and among women from 3 to 8 mm. Improvement is accompanied by a retardation of sedimentation, aggravation by an increase. Recently, at the workmen's sanatorium at Solca further studies were made from the point of view of activity or inactivity

of the pulmonary lesions. "Active lesions" included both those of recent development and those more chronic ones not definitely arrested and necessitating treatment. The attempt was also made to control clinical judgment by studying the effects of tuberculin injections on the sedimentation time, following similar observations by Grafe and Reinwein, who found marked alterations induced in tuberculosis in active evolution. Popper has followed Westergren's technique, slightly modified, obtaining the blood by venous puncture in a 1 cc. syringe, which contains 0.1 cc. of a 5 per cent sodium-citrate solution, and transferring the mixture to test tubes of 5-mm. diameter, graduated in centimetres and taking the readings after one hour. There were 110 patients, mostly with incipient or chronic latent lesions. In 33 cases the sedimentation reaction was pathologically accelerated. In most of these the symptoms or subsequent developments corroborated the supposition of activity. Other cases, with well-marked pathological signs, gave readings not far from normal, and the lack of associated symptoms usually bore out the conclusion that their lesions were inactive or quiescent. A group of "pseudotuberculous," containing neurasthenics, anemics, bronchitics, etc., gave readings approximately within normal limits. The effects of tuberculin injections on the sedimentation time were found to be quite variable, in both the tuberculous and nontuberculous groups, and this method was concluded to be not very helpful in diagnosing active tuberculosis. One may say, however, that the prognosis was generally best in those whose rapidity of sedimentation diminished following the first injection of tuberculin. For purposes of diagnosis, a normal sedimentation time speaks against active tuberculosis, an accelerated sedimentation for it. The technique is so simple as to furnish a readily available aid for the clinician.—*Valeur de la vitesse de sédimentation des hématies pour le diagnostic de la tuberculose active, M. Popper, Rev. d. l. Tuberc., August, 1925, vi, 497.*—(*A. P.*)

Red-Cell Sedimentation Reaction.—A review of the literature indicates the sedimentation time of the red corpuscles to be accelerated during pregnancy and menstruation, in acute febrile illnesses, syphilis, nephritis, malignant tumors and pulmonary tuberculosis. The majority of writers think it may furnish valuable information both as to diagnosis and prognosis in pulmonary tuberculosis. To determine the truth or falsity of this belief, a study of 84 subjects was made and the technique used is described. In 36 frankly tuberculous subjects, with bacilli in the sputum, with ulcerocaseous lesions and high fever, the time varied between fifteen and fifty-five minutes. In caseous pneumonia it was from twenty to thirty minutes. In 11 frankly tuberculous subjects with positive sputum, but slight fever and tendency to fibrosis, the time was from 70 to 120 minutes. In one case of tuberculous peritonitis without pulmonary lesion, it was 168 minutes; in 2 cases of old pleurisy in good condition, 200 minutes; and in 2 cases of peribronchial sclerosis with negative sputum, 205 and 125 minutes. In 18 nontuberculous subjects it was between 250 and 700 minutes. In 11 cases of artificial pneumothorax it was noted that as they improved the sedimentation time was lengthened, while if they grew worse it was accelerated. Since so many other conditions may cause an acceleration of sedimentation its diagnostic value is doubtful, but as a means of prognosis it is useful, because moderate or marked acceleration of the time in a frankly tuberculous subject gives an indication, when other factors are doubtful of the severity of the trouble. Finally, it gives valuable information during artificial-pneumothorax treatment, as to whether the patient is improving or growing worse.—*Valeur clinique de l'étude des variations du temps de sedimentation globulaire dans la tuberculose pulmonaire, M. Salmon and J. Vallis, Presse Méd., May 16, 1925, no. 39, 644.*—(*E. H. K.*)

Red-Cell Sedimentation Reaction.—One cannot conclude much from the sedimentation rate. Patients with clearly demonstrable X-ray changes and clinical signs may have a normal sedimentation rate. In bronchitis it is usually normal. But in apical tuberculosis the rate, although at first normal, will often become increased; so the reaction must be done repeatedly at intervals to be of much value. Tuberculosis of moderate severity shows, in general, a moderate acceleration of the sedimentation rate. In fibrous tuberculosis the rate is somewhat slower than that in tuberculosis with cavity, but the latter may at times show a normal rate of sedimentation, especially if the red blood count is high. In pneumothorax cases rates are relatively high, especially if collapse is good; this results from the concentration of the red cells in the circulating blood, incident to the diminution in pulmonary surface. Slight differences in rate indicate nothing as to progress of the disease or as to prognosis. Sudden and considerable increases in rate frequently indicate the occurrence of a complication, such as pleurisy or empyema. The hopes of those who brought out the test, that it

would be a valuable prognostic procedure, have not been fully realized. One can always say, however, that any case of tuberculosis which always has a sedimentation rate of less than 30 minutes has a grave prognosis, but this is as far as one can go at present.—*Blutsenkung und Blutdifferenzierung bei Lungentuberkulose, J. Weichsel, Deutsche med. Wchnschr., November 21, 1924, 1603.*—(*H. S. W.*)

Red-Cell Sedimentation Reaction.—Observation of the sedimentation rate of red blood cells in 1,700 cases has shown that the procedure is not all that has been claimed for it as a differential diagnostic measure, but as a guide to therapy or prognosis it is of the greatest value. It may be used to indicate the desirability of increase or decrease in dosage of tuberculin. It is also a good guide in surgical treatment, heliotherapy, etc. It is to be regarded as a, valuable addition to other recognized methods, but it does not replace them. The procedure should be done by a trained observer with experience.—*Bedeutung der Senkungsreaktion bei der kindlichen Tuberculose (1700 Reaktionen), R. Wachter, Deutsche med. Wchnschr., May 23, 1924, l, 687.*—(*H. S. W.*)

Red-Cell Sedimentation Reaction.—The sedimentation rate, like adrenalin hypersensitiveness, parallels the extent and also the severity of the tuberculous process, so that there is a definite relation between the disease course, sedimentation rate, and irritability of the vegetative nervous system, which would indicate that an increased sedimentation rate is an expression of a change in the reaction power of the vegetative system. Since the sedimentation rate is frequently not in harmony with the clinical findings, it can only be evaluated properly when correlated with the other tests of vegetative allergy.—*Die Senkungsgeschwindigkeit der roten Blutkörperchen bei Lungentuberkulose und "Vegetative Allergie," E. Weigeld, Beitr. z. Klin. d. Tuberk., 1924, lx, 73.*—(*H. J. C.*)

Red-Cell Sedimentation Reaction.—The rapidity of sedimentation is known to be subject to variation under normal conditions. It is more rapid in women than in men, especially during the menses or pregnancy, also more so in children than adults. It is exaggerated in various infectious diseases, pelvic tumors, syphilitic disease and arteriosclerosis. There are at present two methods of estimation, (1) that of Westergren-Katz, (2) that of Linzenmeier. The former is simpler and less liable to error. As regards the diagnosis of tuberculosis, most authors have not found the test of much value. In acute and subacute forms sedimentation is usually markedly accelerated; in chronic fibroid forms it approaches normal. However, in cachectic states it becomes retarded. It is recognized that in certain active cases, in which the figures would be expected to be high, it approaches normal. The relation of sedimentation to various chemical and serological changes in the blood has recently been studied. Most of these observations, however, yield less information than bedside observation.—*La sédimentation des hématies sa valeur pour le diagnostic et le prognostic de la tuberclose, P. Meignant, Rev. d. l. Tuberc., June, 1925, vi, 358.*—(*A. P.*)

Red-Cell Sedimentation Reaction.—The red-cell sedimentation test, according to Westergren-Katz was performed in 2,500 cases, for a total of 10,000 examinations, and it is believed that the test is a valuable clinical method. On the whole, it indicates the severity of the disease. The lowest values are seen in inactive or slightly active tuberculosis, with mild catarrh and with relatively good prognosis; the highest values are found in patients with highly progressive processes, and indicate marked tissue destruction and absorption of split-products of protein. The reaction is not specific.—*Objektive Heilstätten-Statistik, T. Petri, Beitr. z. Klin. d. Tuberk., 1925, lxi, 596.*—(*H. J. C.*)

Red-Cell Sedimentation Reaction.—In all cases with activity there was a marked acceleration in the sedimentation rate, which diminishes with the disappearance of activity. Caution is advised in examining incipient cases, especially when other etiological possibilities enter. The method is considered valuable in general practice.—*Kurzer Beitrag zur Frage der praktischen Verwertbarkeit der Blutkörperchensenkungsreaktion für die Tuberkulosediagnostik, R. Treu and R. Leffmann, Beitr. z. Klin. d. Tuberk., 1924, lix, 311.*—(*H. J. C.*)

Red-Cell Sedimentation Reaction.—The work of Gräfe on the effect of subthreshold doses of tuberculin on the red-cell sedimentation rate was repeated and corroborated. The differences before and after injection, with one exception, paralleled clinical findings, at times preceding them. The test is satisfactory only in early cases of fibroid phthisis, or in old cases with slight reactivity. With high doses, above 0.025 mgm. of O.T., transient harm was observed. The sedimentation test is a valuable adjunct

in diagnosis.—*Kurze Mitteilung über unsere Erfahrungen mit der Erythrocyten-Sedimentierung in Kombination mit der Injektion kleiner, unterschwelliger Tuberkulin-dosen, Frida Grube, Beitr. z. Klin d. Tuberk., 1924, lix, 35.*—(*H. J. C.*)

Red-Cell Sedimentation Reaction.—The sedimentation rate is to be used only in combination with other methods of observation. This is especially so in the diagnosis of incipient tuberculosis. A negative finding occurred frequently in questionably active cases, even when distinct disease was found. Prognostically, serial examinations are valuable.—*Über die klinische Bedeutung der Bestimmung der Senkungsgeschwindigkeit der roten Blutkörperchen bei der chronischen Lungentuberkulose, F. Junker, Beitr. z. Klin. d. Tuberk., 1924, lix, 123.*—(*H. J. C.*)

Red-Cell Sedimentation Reaction during Measles.—A series of 20 children was studied by means of the red-cell sedimentation reaction, during the course of measles while sanatorium residents. In the majority of active tuberculosis cases the sedimentation values diminished markedly, and in many cases dropped to values (7 minutes) which were noted only in the most severe cases of tuberculosis without measles. The diminution in the sedimentation rate did not always indicate an unfavorable prognosis. Even in children with latent tuberculosis sedimentation values decreased, but not so markedly, and the return to normal was more rapid and more complete. Diminution in the sedimentation rate during mealses indicates lowered immunity to tuberculosis during measles.—*Masern und Tuberkulose. Ihre Immunilätsverhältnisse im Lichte der Erythrocytensedimentierung, R. Wachter, Ztschr. f. Tuberk., 1924, xl, 353.*—(*H. J. C.*)

Red-Cell Sedimentation and Daranyi Reactions.—Two hundred fifty male patients were studied by means of the red-cell sedimentation and Daranyi reactions. In 77.6 per cent there was an agreement between the two, in 22.4 there were differences, while in 17.2 per cent there was complete disagreement. When the sedimentation reaction was positive and the Daranyi negative there was found a weakened constitution, frequently a secondary anemia, and almost always an active pulmonary tuberculosis, extensive and predominantly exudative. When the sedimentation reaction was negative and the Daranyi positive, the patients were always robust individuals with mild or moderate disease of favorable type and good prognosis. Among 20 cases, in which the sedimentation and Daranyi reactions were elaborated by other observations on the blood, it was found that diminution in the red count, volume and hemoglobin content caused a hastening of the reaction and *vice versa*. Aside from this influence of the erythrocytes the relations between the sedimentation reaction and the Daranyi reaction were not clear.—*Vergleichende Untersuchungen über Blutkörperchen-Senkungsreaktion, Daranyireaktion und Erythrocytenbefund bei der chronische Lungentuberkulose, C. Kruchen, Ztschr. f. Tuberk., 1924, xli, 259.*—(*H. J. C.*)

Daranyi Reaction.—The Daranyi lability test of the serum was used in conjunction with the Wassermann reaction, the blood picture and the red-cell sedimentation rate. Daranyi's directions were closely followed, and the Linzenmeier sedimentation method was used. The cases were classified according to the clinical activity of the tuberculosis. Thirty-five cases of suspected tuberculosis were especially significant, in that the blood picture, sedimentation rate, and serological findings left much to be desired, and led to the conclusion that clinical observations were most valuable. Tuberculous pleurisy regularly gave a positive Daranyi test, which was performed after intracutaneous tuberculin injection and proved unsatisfactory. The test gave a large number of positives in nontuberculous cases, including malignant tumors, furunculosis, acute articular rheumatism, endocarditis and pneumonia, and also in some healthy individuals. It is concluded that the Daranyi reaction alone is of no value in the diagnosis of early active tuberculosis, and only in conjunction with other reactions, including the Wassermann, sedimentation rate and blood picture, and the clinical findings, does it possess any significance. It gives no information as to the activity of a process, while a negative reaction does not exclude tuberculosis.—*Beitrag zur Serodiagnostik der Tuberkulose mit der Daranyischen Kolloidlabilität, A. Cohn, Ztschr. f. Tuberk., 1925, xlii, 484.*—(*H. J. C.*)

Flocculation Reaction in Tuberculosis.—In children the serum, in cases of tuberculosis, syphilis and (at times) chronic pneumonia, gives a positive flocculation reaction with ammonium sulphate in concentration of 18 to 19 per cent. Since the two latter conditions can easily be excluded, the diagnostic value of this reaction becomes evident. The more intensive the tuberculous process the more marked the flocculation with a definite concentration. A weakening or disappearance of the reaction

indicates a favorable prognosis.—*Die Diagnose der Tuberkulose mittels Ausflockungsreaktion, F. v. Kovats, Beitr. z. Klin. d. Tuberk., 1924, lix, 645.*—(*H. J. C.*)

Fornet's Diagnostic Method.—Fornet's agglutination method was tested on tuberculous, syphilitic and healthy human serum, as well as that from animals. In healthy individuals the reaction was negative, but at times slightly positive. The animal sera were all positive, and the syphilitic sera strongly positive without there being any relationship between this and the state of immunity of the patient. It was further determined that the reaction was not one of agglutination, but rather of precipitation, and dependent upon the content of serum albumin and globulin and their relation to each other. It is concluded that the Fornet reaction is a nonspecific, nonimmune reaction and can, therefore, be of no diagnostic value in tuberculosis. As a result of tests with other chemical mixtures, it is concluded that the Fornet preparation is a 0.6 per cent carbolic-acid solution of sodium phosphate containing a small amount of the acid constituents of the bacilli, and that the reaction is dependent, not upon the bacillary content, but rather upon the acidity, and that the sodium phosphate precipitates certain serum-protein fractions.—*Studien über den Wert des Fornetschen Tuberkulosediagnosticums und ihre Zusammensetzung, G. Bignami, Ztschr. f. Tuberk., 1924, xli, 194.*—(*H. J. C.*)

Fornet's Diagnostic Method.—The serum of tuberculous individuals is supposed by Fornet to agglutinate tubercle bacilli. The proprietary preparation of Fornet yielded positive tests in dilution of 1 to 200, and such a result indicates the probability of tuberculosis. No further conclusions are possible until the nature of the preparation is known.—*Ueber Tuberkelbazillenagglutination nach Fornet, L. Kogan, Deutsche med. Wchnschr., May 23, 1924, l, 677.*—(*H. S. W.*)

Matefy Reaction as Guide of Activity.—The Matefy reaction is considered simple and of value in determining the grade of tissue destruction, thus being a valuable method for the diagnosis of activity. Of 45 cases of tuberculosis verified clinically, 37 (82 per cent) were positive, the exudative forms reacting most markedly. The test cannot be used in early tuberculosis. It is valuable from a diagnostic standpoint in eliminating simple catarrhal processes. It is also of significance prognostically. Since the reaction is nonspecific it is also positive in other diseases in which tissue destruction is occurring, such as carcinoma, chronic nephritis, pneumonia, syphilis, etc. During pregnancy in the eighth to tenth month and the puerperium it was also positive.—*Über die Seroreaktion nach Matefy zur Feststellung der Aktivität des tuberkulösen Prozesses, A. Skutetzky, Ztschr. f. Tuberk., 1925, xliii, 34.*—(*H. J. C.*)

Serodiagnosis of Tuberculosis.—By the Bonacorsi flocculation reaction, positive findings were obtained in 91 per cent of tuberculous individuals, 11.3 per cent nontuberculous, and 66 per cent syphilis. If the Sachs-Georgi positive sera were excluded the specificity of the reaction proved far better. Better results were obtained if an antigen, consisting of an alcoholic extract of 1 per cent beeswax to which was added 1 per cent cholesterol in a dilution of 1 to 10, was used. Without the addition of cholesterol to the wax extract no flocculation occurred. This led to the assumption that the active substance in the Bonacorsi reaction was cholesterol. Pure cholesterol solutions also gave reactions.—*Zur Serodiagnose der Tuberkulose und ihre Bedeutung für die Prognose und Differtialdiagnose, F. Mündel, Beitr. z. Klin. d. Tuberk., 1924, lix, 622.*—(*H. J. C.*)

Diazo Reaction in Tuberculosis.—The diazo reaction is present in tuberculosis only when the case is advanced, and it indicates an unfavorable prognosis. The duration of the reaction was studied in 24 cases that were followed from the first appearance of the reaction until death which occurred in all but one of the cases. The appearance of the reaction means almost with certainty that exitus will follow within three or four months. In the cases of pulmonary complicated by intestinal tuberculosis, especially when the latter came to give the more conspicuous symptoms and to dominate the situation, the appearance of the diazo reaction usually meant that death would follow in a very few weeks. The patient should be treated by general measures.—*Die Dauer der Diazoreaktion und ihre Bedeutung bei der Lungentuberkulose, K. Lemmens, Deutsche med. Wchnschr., October 17, 1924, l, 1442.*—(*H. S. W.*)

Diazo Reaction in Tuberculosis.—The diazo reaction is not specific in tuberculosis. If used quantitatively in repeated tests it may have some prognostic significance.—*Zur Frage der Diazoreaktion und ihrer Bedeutung bei der Lungentuberkulose, M. Weiss, Deutsche Med. Wchnschr., July 31, 1925, li, 1278.*—(*H. S. W.*)

Diazo Reaction in Bone and Joint Tuberculosis.—The diazo reaction was studied in a large number of cases of bone and joint tuberculosis. Even in cases, in which progressive pulmonary tuberculosis existed coincidently, the diazo reaction was almost never positive, permitting the conclusion that the diazo reaction is negative during the entire course of bone and joint tuberculosis. It appears that bone and joint tuberculosis has an inhibitory influence upon the diazo reaction in severe cases of pulmonary tuberculosis. This further limits the prognostic value of the test.—*Die Diazoreaktion als Prognosticum bei der Tuberkulose des Bewegungsapparates, G. Kelemen, Centralbl. f. Chir., 1925, lii, 1346.*—(*H. J. C.*)

Value of Urochromogen Test.—The urochromogen reaction is a good indicator of increased pathological cellular destruction of proteins. It occurs earlier and more definitely than the diazo reaction. Its value is most significant in prognosis, and it is also serviceable in the diagnosis and therapy of tuberculosis. The test should be continually performed in every febrile case of pulmonary tuberculosis in which the prognosis is uncertain. Prolonged positive reactions indicate the need of surgical therapy, including pneumothorax. Tuberculin treatment is contraindicated when the urochromogen reaction is positive.—*Die Bedeutung der Weisschen Urochromogen-Probe für die Diagnose, Prognose und Therapie der Lungentuberkulose, F. Schmid, Beitr. z. Klin. d. Tuberk., 1925, lx, 251.*—(*H. J. C.*)

Case of Severe Tuberculous Infection.—A case of severe tuberculous infection is recorded, with short duration of about two months, and the absence of a primary affect. Hematogenous dissemination in all probability followed an intestinal focus of older duration. The complete absence of tuberculous processes in individual organs like the right lung and the right kidney was exceptional. The diagnosis was made from the determination of numerous tubercle bacilli, since the histological picture lacked the typical changes of tuberculosis. There were widespread exudative inflammatory processes and necrosis, while productive processes, especially epithelioid and giant cells, were completely absent. As an associated finding there was a mediastinal tumor which, however, seemed to bear no relation to the peculiar course of the tuberculous infection.—*Über einen eigenartigen Fall schwerster Tuberkuloseinfektion, W. Fischer, Beitr. z. Klin. d. Tuberk., 1924, lx, 86.*—(*H. J. C.*)

Treatment of Tuberculous Abscesses.—The type and condition of a tuberculous abscess should dictate the kind of treatment required, for no hard and fast directions can be laid down that would meet every condition. Three types of abscess may be thought of in respect to treatment, namely, productive, reparative and healing. In the productive type, frequent aspiration, unless the material become bloody, is usually indicated, although fistula formation or the introduction of mixed infection are common complications, even when the needle is introduced obliquely. Open incision and scraping of the wall should never be done. Radical surgical procedure may be undertaken in the reparative or healing types in such a way that the pus cavity may be opened and evacuated, and the cavity wall thoroughly washed with iodine or other disinfectant.—*Die Behandlung der Tuberkulösen Abszesse, S. Romich, Wien. klin. Wchnschr., May 1, 1924, xxxvii, 444.*—(*H. S. W.*)

Tuberculosis as Etiological Factor in Otitis Media.—A series of 80 cases of middle-ear infection with suppuration was studied for tuberculosis. The microscopic examinations of the pus were considered unsatisfactory, since other acid-fasts and cocci may be present. Animal inoculation and cultivation should be performed in all cases. In 25.75 per cent of the cases, either cultures or animal inoculations, or both, were positive. In childhood fewer positive cases of middle-ear tuberculosis were found than reported by earlier observers. In purulent ear conditions, in cases of pulmonary tuberculosis, there were 40.6 per cent positive.—*Über die Häufigkeit der Tuberkulose als Ätiologie der Otitis media, M. Nakamura, Ztschr. f. Tuberk., 1925, xlii, 189.*—(*H. J. C.*)

Primary Tuberculosis of Conjunctiva.—A case of primary conjunctival tuberculosis in a child four years old, that died of bronchopneumonia following measles, is described. There was tuberculous lymphadenitis of the superficial and deeper parotid lymph nodes. There were small nodes between the parotid and submaxillary, as well as partly enlarged cervical nodes. All the other organs, especially the lungs and intestines, as well as their tributary lymph nodes, were free from tuberculosis.—*Zur primären Tuberkuloseinfektion der Bindehaut des Augenlides, H. Kudlich, Ztschr. f. Tuberk., 1925, xliii, 66.*—(*H. J. C.*)

Prognosis of Scrofula.—It has long been thought that scrofula in childhood or adult

life confers a protection to its bearer against pulmonary tuberculosis in later life, although numerous writers have asserted that this is not the case. In a survey of 5,156 histories in a sanatorium for the tuberculous, 391 patients were found to have had scrofula. Follow-up observations on these cases, nearly all of whom were females, disclosed that about 25 per cent of them subsequently developed pulmonary tuberculosis. Scrofula seemed definitely to give a considerable but not complete immunity to pulmonary tuberculosis before the age of puberty, but little or none after that period.—*Ueber die Prognose der Scrofulose, O. Connerth, Deutsche med. Wchnschr., March 26, 1926, lii, 533.*—(*H. S. W.*)

Scrofula and Disease of Teeth.—Under the term *scrofula* are included those affections in which an "exudative diathesis" favors the development of bacteria. There are tuberculous and nontuberculous types. An association has long been noted between scrofula and caries of the teeth, and the impression is well grounded to-day that there is a relation between the two processes, although statistical evidence to prove the relation is lacking. It is safe to say, however, that most constitutional affections increase the liability to caries. It has also been claimed, and with more supporting statistics, that the extent of carious change is greater in scrofulous than in healthy children. Malformation and hypoplasia of the teeth in scrofula have also been described, and are attributed to the effect upon general and particularly calcium metabolism. The claim has been made that scrofula favors early eruption of the teeth, and the eruption of the permanent teeth may also be hastened. It is certainly true that all diseases in which persistent fever occurs hasten the eruption of both sets of teeth. This early eruption of teeth is chiefly due to the effect of irritative toxins. However, the later development is delayed, probably because of disturbance in the calcium metabolism. While scrofula thus probably plays an important if not consistently well defined rôle in the production of caries in teeth, carious teeth in turn favor the development of scrofula. Occasionally the broken mucosa around erupting teeth may furnish a portal of entry for tubercle bacilli, but carious teeth are more dangerous in this respect. Tubercle bacilli have been found in caries, and infection has been introduced in animals in experimental caries. The inflammation of the mucosa around carious teeth also facilitates the entrance of microörganisms. The wide root canals of children favor the passage of the infection. It is difficult to explain, however, the apparent relative rarity of this mode of entrance, in view of the wide prevalence of carious teeth. The conditions in the mouth seem to be ordinarily unsuitable for the development of tubercle bacilli. Not all lymph-node swellings in the neck, which pass as scrofula, are the result of tubercle bacillus infection. Some are pyogenic infections, in which again the teeth serve as portal of entry. The swelling in this case goes down on repair or removal of the infected teeth. The dentist may thus aid in the diagnosis of cervical lymph-node enlargements, as well as in the reduction of scrofula. Scrofula is a disease of that period of life when children are under the observation of the school dentists, and the dentist has much responsibility in this connection.—*Skrofulose und Zahnkrankheiten, H. J. Tholuck, München. med. Wchnschr., May 15, 1925, lxxii, 794.*—(*E. R. L.*)

Treatment of Laryngeal Tuberculosis.—If the general condition of the patient permits, radical surgical measures should be used in treating laryngeal tuberculosis. The most effective remedy in surgical treatment is the galvanocautery. This not only destroys or removes the diseased parts, but it also strongly stimulates the remaining tissue to rapid connective-tissue formation. This produces more favorable results than quartz light, heliotherapy and other such methods.—*Die Behandlung der Kehlkophtuberkulose nach dem Standpunkt der neueren Erfahrungen, Stenger, Deutsche med. Wchnschr., July 17, 1925, li, 1185.*—(*H. S. W.*)

Surgical Treatment of Laryngeal Tuberculosis.—Operative intervention of laryngeal tuberculosis requires a most detailed study of the pulmonary process and the general condition. The pulmonary process must be stationary, there must be no pyrexia, and the sputum must not contain large numbers of tubercle bacilli.—*Beitrag zur chirurgischen Behandlung der Kehlkopftuberkulose, W. Haardt, Beitr. z. Klin. d. Tuberk., 1925, lx, 284.*—(*H. J. C.*)

Light Treatment of Laryngeal Tuberculosis.—The Goerz-Wessely lamp, as developed in Vienna for the treatment of laryngeal tuberculosis, burns with specially constructed and impregnated carbon bars and produces a light with the blue end of the spectrum complete. The greatest concentration of rays is thrown to one side and made to converge through the medium of a quartz optic. The heat rays are absorbed by a water-jacket connected with the quartz optic. In

patients in good condition irradiation is given through the Seiffert universal direct laryngoscope. In frail patients steel mirrors are used to reflect the light into the larynx under the guidance of the patient himself, who sits in front of a large, centrally perforated mirror, and can see his own larynx. Personal observation of patients thus treated showed that superficial tuberculous ulcers heal rapidly, while granulations become smaller and shallower. Infiltrations of the posterior wall of the larynx become smaller. Dysphagia when due to superficial ulceration often disappears after two or three exposures. Treatment has been begun on a series of cases with a lamp of this sort imported to this country.—*The Treatment of Laryngeal Tuberculosis with the Goerz-Wessely Lamp, J. W. Miller, Med. J. & Rec., February 3, 1926, cxxiii, 166.*—(*E. H. K.*)

Tuberculosis of Epiglottis.—The case presented was that of a tumor, the size of a hazel-nut, situated on top of the right half of the epiglottis. Its central part was spherical, gray and smooth. It descended on the lingual surface to the glosso-epiglottic fold, but not as far posteriorly. The remainder of the laryngeal vestibule was infiltrated, red and irregular. There were dysphagia and dysphonia. The patient's general condition was poor, and auscultation revealed signs of a cavity at the right apex. Biopsy confirmed the tuberculous nature of the mass.—*Tumeur tuberculeuse de l'épiglotte, Chatellier, Vallat and Hude, Meeting, Soc. de Laryngologie, d'Otologie et de Rhinologie de Paris, February 12, 1925, reported in Presse Méd., March 7, 1925, no. 19, 305.*—(*E. H. K.*)

Tuberculosis and Heart Disease.—The decline in the tuberculosis death-rate in the last two decades invites serious attention to the malady that has supplanted tuberculosis as "captain of the men of death." Although tuberculosis still ranks among the major killing diseases, its past steady decrease is an almost certain augury of continued lessening of its menace, and suggests that we be prepared, as tuberculosis becomes a less grave problem, to place in the campaign against the new "captain of death" as many as possible of the resources with which we have successfully fought the old. The cut of more than half in tuberculosis mortality during the last twenty years brings into sharp contrast the situation with respect to mortality from heart disease, which has increased 31 per cent in the United States during approximately the same period. Contrasting the age periods at which heart disease and tuberculosis cause the greatest mortality, it will be seen that tuberculosis still holds first rank from the ages 20 to 40, while heart disease becomes the leading cause of death soon after the age of 40. And so great is the increase that in totality heart disease exceeds every other. Thus, cardiac disease has come to be a seriously fatal factor in our economic life, sweeping off great numbers of persons at the height of their productiveness. Unlike tuberculosis, the cardiac problem lacks the fear of infection and the consequent articulate demand by the profession and the public for segregaton; this increases the difficulties of arousing general interest in its seriousness. Unfortunately, at present the cardiac patient rarely comes under observation except when his symptoms are pronounced enough to interfere with his work or pleasure, and it is a common experience to find decompensation advanced to a point where symptoms are so severe as to interfere with ability to undertake any productive activities. Naturally the future of such patients is precarious. It seems really doubtful whether any great progress can be made in the intelligent handling of this problem until we know more of the various factors that enter into the making and treating of the cardiac patient. For the rehabilitation of such a patient there is required a study of his past, observation of his present, and an estimation of his future capacities. The personnel and equipment of the modern tuberculosis sanatorium are peculiarly well adapted to the treatment of heart disease. Obviously, there is lacking in heart disease the urge for segregation of the patient that has been so successfully employed in tuberculosis because of its infectiousness, and yet separation of the cardiac patient from the environment in which he got sick is often quite as important from the standpoint of recovery as it has proved to be in the treatment of tuberculosis. To remove him from the usual worries and stresses in the home may be the first assured step in his convalescence. The average cardiac patient with mild or moderate symptoms should receive quite prompt and lasting benefit from the kind of treatment that can be supplied in tuberculosis sanatoria. Specifically, the cardiac patient requires rest in bed. No remedy equals it; only through persistent and sustained rest can recuperation begin. While resting, the patient offers the required opportunity for the necessary clinical and laboratory study. When rest has served its purpose, exercise is utilized to restore tone and efficiency to the circulatory apparatus and the body. All the forms of occupation and exercise that have been employed in the tuberculosis sanatorium are available and useful to restore the cardiac

patient. Walking, controlled by distance rather than by time, is a potent form of restorer to a weakened myocardium. In cardiac patients, with an associated nephritis, diet becomes an important feature in the treatment, and the provision for proper diet for such patient is quite within the possibilities of any tuberculosis sanatorium. Baths have been extensively used in the spas in the treatment of some forms of cardiac disease, and such baths as may be thought helpful can be readily and inexpensively reproduced in any institution. The one possible objection to the treatment of heart disease in a tuberculosis sanatorium would be the fact that most sanatoria are constructed largely to provide a maximum of out-of-door life, and obviously many cardiac patients cannot be treated out of doors in cold weather. In many institutions it would be possible, however, to increase the number of heated rooms and wards, and this, without undue expense, would permit the care of any type of cardiac patient. Many patients with the early and milder forms of heart disease are not jeopardized by out-of-door life; indeed they are benefited by exposure to the open air. Moderate altitudes are not prejudicial to the treatment of cardiac subjects, and it can be safely said that most such cases are not embarrassed by heights up to 1,500 feet. The Metropolitan Life Insurance Company, in its Sanatorium at Mount McGregor, has for several years cared for patients with heart disease as they have been recognized among the company's staff of employees. The general plan of treatment provides for complete bed-rest of every admitted patient until the essential examinations have been made, the period of rest depending on the condition of the vascular system and the patient's response to treatment. The rest period, which has averaged 44 days, is then followed by a period of graduated exercise, until it is demonstrated either that the vascular system has not enough resources to enable the patient to resume work, or until the patient can take up an occupation. Up to December 31, 1924, 412 cardiac patients had been discharged from the sanatorium. The average period of treatment for this entire group was four months and twenty-six days. Briefly, the present condition of this group is as follows: Of the 412 patients, 198, or 48 per cent, are able to do full-time work; 12, or 3.2 per cent, are carrying on modified work; 109, or 26.4 per cent, are unable to work; and 79, or 19.2 per cent, are dead. Thirteen, or 2.3 per cent, are untraced. From this isolated and quite novel experience the treatment of heart disease in a tuberculosis sanatorium has been demonstrated as possible and satisfactory. To the patient has come an opportunity, similar to that provided the tuberculosis patient, to acquire the maximum recovery of which he is capable, to learn his physical capacities and limitations, and, most important, to prepare for his adjustment to the environment in which he lives and works. In the study and treatment of the cardiac patient, there awaits the physician, whose interest has been centered on the study of chest disease, a new medical interest, stimulating, absorbing and rewarding.—*Parallelism in the Treatment of Tuberculosis and Cardiac Disease, H. J. Howk, Arch. Int. Med., January 15, 1926, xxxvii, 119.—(J. S. W.)*

Tuberculous Pericarditis.—Following the removal of 700 cc. of fluid by epigastric puncture, recovery occurred after a number of months from serofibrinous tuberculous pericarditis with a large effusion. The patient was a child of fourteen years.—*Péricardite tuberculeuse à grand épanchement terminée par guérison, Nobécourt and Janet, Meeting, Soc. de Pédiatrie de Paris, June 16, 1925, reported in Presse Méd., July 4, 1925, no. 53, 894.—(E. H. K.)*

Pericardotomy without Drainage in Tuberculous Pericarditis.—Two cases treated in this manner are reported. The first resulted fatally, the second in cure. Aspiration is only of temporary value, and should be used only for diagnosis and to determine the cytology of the fluid, a predominance of lymphocytes being a favorable sign. The method of Delorme is used, since the movable wall resulting from the partial resection of the costal cartilages ameliorates the inconvenience of subsequent adhesions. Drainage only leads to fistulization and secondary infection. It is recommended that the pericardium be left open, thus bringing about an interior drainage into the spaces surrounding the pericardium.—*Deux cas de péricardite tuberculeuse traités par la péricardotomie sans drainage, Bressot, Meeting, Soc. de Chirurgie de Lyon, May 28, 1925, reported in Presse Méd., June 13, 1925, no. 47,792.—(E. H. K.)*

Intrathoracic Lymphadenopathy.—In discussing the diagnosis and treatment of intrathoracic lymphadenopathy from a roentgenological viewpoint, consideration is limited to the hilum nodes, and particularly to tuberculous infection of these structures. The difference of opinion as to what constitutes a normal hilum shadow is reviewed. Though, previously, a very prominent clean-cut shadow was demanded before a hilum could even be mentioned, the favorable

results obtained by roentgentherapy directed at some of the suspicious but not positive hila, according to conservative interpretation, have converted the author to the more radical side of the question. The patients to whom this applies are not adults, in whom hilum changes are of less significance, but are under twenty and generally under ten years of age. The associated symptoms are afternoon rise of temperature to 99° or 100°F., cough, recurrent colds, preadolescent retardation of development so often ascribed to hypertrophied tonsillitis, and in 50 per cent of the cases, cervical adenitis. In practically all cases of tuberculous hilum adenopathy there is roentgenographic evidence of an active or inactive tuberculous focus in the corresponding lung, which rather argues against the descending mode of infection from infected cervical lymph nodes. Repeated doses of one-third erythema dose of short rays or two-thirds erythema dose of longer rays are given at intervals of six weeks, with physical and roentgenographic examination before each treatment. No more than three treatments have been necessary to produce symptomatic improvement and complete regression of the adenopathy. Theories of the action of roentgen rays in producing these results are reviewed. Among them may be mentioned the liberation of a substance toxic to bacteria by the destruction of lymphocytes, raising of the opsonic index, and liberation of bacilli from giant cells, this permitting their destruction.—*The Diagnosis and Treatment of Intrathoracic Lymphadenopathy from A Roentgenological Viewpoint, Preliminary Report, J. D. Lawson, Am. J. Roentgenol. & Rad. Ther., November, 1925, xiv, 427.*—(*E. H. K.*)

Diagnosis of Clinical Hilum Tuberculosis.—The distinction is drawn between pathological and clinical hilum tuberculosis. *History:* This is of first importance. It includes (1) a definitely demonstrated history of exposure to infection, (2) frequent coughs and colds, which, however, are more apt to be due to bad tonsils and adenoids, (3) a period of debility following whooping cough or measles, (4) a history of being a "delicate child," and (5) enlarged lymph nodes in the neck or elsewhere. *Symptoms:* First in importance is undue fatiguability, the most likely cause of which is a tuberculous toxemia; (2) changes in temperament; (3) cough and sputum, which are unusual; (4) fever, which may not, however, be demonstrable; (5) rapid pulse; and (6) loss of weight, underweight, malnutrition. Careful personal observation is here of more value than fixed standards. *Physical Signs:* Rarely is any valuable information obtained from the chest examination. *X-rays:* These may be an aid, but are not of first importance. They cannot be expected to differentiate between abnormal root shadows causing symptoms and those that are not causing symptoms, nor necessarily between shadows due to tuberculous and non-tuberculous infections. There are no firmly established standards of normality, and as a rule practitioners accept X-ray evidence and dicta too freely. To sum up, the following are *requisites for a positive diagnosis: 1:* Exposure. *2:* Real malnutrition and underweight. *3:* Ease of tire or constant tiredness. *4:* Temperamental changes. The following are *important but not essential: 1:* A positive cutaneous tuberculin test. *2:* X-ray evidence of marked hilum changes. The following are of *negative diagnostic value: 1:* Presence of bad tonsils, adenoids, etc. *2:* Apparent but not real underweight. *3:* Repeated negative cutaneous tuberculin tests. *4:* Absence of ease of tire. *5:* Negative X-ray evidence. The paper was discussed as follows: *H. D. Chadwick:* A negative family history requires close checking up. In regard to malnutrition, a standard for the state clinic work has been set at 10 per cent underweight, but all known contact cases are examined in any event, as are any others thought by the teachers to require examination. In regard to physical examination, percussion is thought to be of some value if carefully performed; it should be light, and the sense of touch plays really more part than sound. *G. W. Holmes:* It is agreed that the question is clinical rather than pathological. The physician must not expect the roentgenologist to make too broad statements. In many cases there is mottling around the hilum, suggesting an infection which has spread, yet it may be due to other causes than tuberculosis. The X-ray plates are a fairly good means of checking up as to the presence or absence of enlarged glands. *R. D. Leonard:* Undoubted hilum tuberculosis from an X-ray standpoint is extremely rare. Jacques has seen only 12 cases. We should be careful in pinning this diagnosis on certain morphological root changes. It is also doubtful whether true peribronchial tuberculosis exists. X-ray plates are too often interpreted according to the accompanying clinical history. The X-ray, however, is of value in excluding real tuberculosis of the lungs. *J. B. Hawes, 2nd (concluding):* While some skepticism is needed, there certainly is a condition which must be called "hilum tuberculosis." It is often clearly revealed by the X-ray, which is also of psychological value in handling the parents.—*The Diagnosis of Clinical Hilum*

Tuberculosis, J. B. Hawes, 2nd, Boston M. & S. J., January 21, 1926, cxciv, 91.—(A. P.)

Symptomatology of Tuberculous Mediastinal Pleurisy.—Non tuberculous meta-pneumonic mediastinal pleurisies are notable for their stormy and rapid course and frequent fatal issue. The abdominal organs, through the vagosympathetic nerve, or as a result of circulatory disturbances, can be involved, and pleural pericardial adhesions can occasion severe decompensation. Exudative mediastinal pleurisy of tuberculous origin has a more benign course. Six cases are described, occurring, in the majority of cases, in young patients. The clinical signs are not characteristic; but emphasis in diagnosis is laid upon roentgen examination, which must be performed in various ways. Shadows designating changes in the anterior mediastinum move with rotation coincidently with the aorta; if the shadow moves coincidently with the vertebrae the disease is located in the posterior mediastinum. Difficulty is encountered when the exudate or granulation-tissue shadow lies within the heart shadow. When the condition involves the mediastinal "weak spots," as designated by Brauer, a bilateral process may occur. The shadow is triangular, but the lateral side only is well defined. With inspiration the entire shadow becomes longer and thinner. Whether an exudate or granulation tissue exists cannot be differenitated roentgenologically. An exploratory puncture will not always clarify the situation. Mediastinal pleurisies are rarely individual conditions, but usually are symptoms of a pulmonary tuberculosis.—*Beiträge zur Symptomatologie der Pleuritis mediastinalis tuberculose, E. Fodor and A. Weisz, Beitr. z. Klin d. Tuberk., 1925, lx, 407.—(H. J. C.)*

Etiology of Serous Pleurisy.—The view that the majority (between 87 and 98 per cent reported by various authors) of serous pleurisies are of tuberculous origin is not verified by study of over 1,000 cases. Tuberculosis cannot be diagnosed in all cases in which cultures remain sterile, but cytodiagnosis and animal inoculation must be resorted to. Regarding cytodiagnosis, the rules of Widal and Ravault, that a predominance of lymphocytes indicates tuberculosis, and that of other leucocytes means a nontuberculous etiology, while preponderance of endothelial cells signifies a transudate or malignant disease, cannot be considered infallible, but only valid in 70 to 80 per cent of cases. A predominance of lymphocytes indicates tuberculosis only in early effusions; after the fluid has existed for some time other factors may play a part. Far more valuable is animal inoculation, since large amounts of material, 10 to 15 cc. of exudate, can be injected. By this means about 50 per cent of pleurisies were found to be tuberculous. A negative animal inoculation, in the presence of undoubted clinical tuberculosis, has rarely been seen. Right and left-sided pleurisies were equally frequent, and the severity of the disease did not permit differentiating tuberculous from a nontuberculous pleurisy, but a short course of the disease lent probability to its tuberculous character. The prognosis was better in younger than in older patients.—*Zur Prognose und tuberkulösen Ätiologie der serösen Pleuritis nach den Tierversuchen und Krankengeschichten der medizinischen Klinik des Kantonsspitals Zürich, P. Silberschmidt, Beitr. z. Klin. d. Tuberk., 1924, lx, 128.—(H. J. C.)*

Cure of Bronchopleural Perforation.—A tuberculous patient, at first benefited by artificial pneumothorax, developed a pleural effusion and later a bronchopleural perforation. After aspiration of the fluid a large quantity of gomenol was injected into the pleural cavity. When fever became less following this procedure extrapleural thoracoplasty was performed. This resulted in permanent cure.—*Guérison d'une perforation broncho-pleurale large dans un pneumothorax artificiel par thoracoplastic combinée avec l'oléothorax, Burnand, Meeting, Soc. Méd. des Hôpitaux de Paris, May 29, 1925, reported in Presse Méd., June 6, 1925, no. 45, 750.—(E. H. K.)*

Hemicolectomy in Ileocecal Tuberculosis.—Fifteen days after anastamosis of the ileum and transverse colon, right hemicolectomy was performed on a woman of fifty years for ilecocecal tuberculosis. The first stage was performed through a small subumbilical incision, and the second through a right iliac incision. The two-stage operation is considered the best procedure and prolongs only slightly the hospital stay of the patient.—*Tuberculose iléo-caecale; hemicolectomie droite après dérivation interne, Delore, Conte and Labry, Meeting, Soc. Nationale d. Médecine et d. Sciences Médicales d. Lyon, May 21, 1925, reported in Presse Méd., June 6, 1925, no. 45, 752—(E. H. K.)*

Diagnosis of Surgical Tuberculosis.—The diagnosis of surgical tuberculosis is often a matter of great difficulty. It is to be differentiated from the following conditions: *1: Syphilis,* which often resembles cold abscess, skin tuberculosis, bone tuberculosis, etc , but a good therapeutic result

from antisyphilitic therapy is always decidedly helpful. *2: Inflammatory processes*; Tuberculous abscess is usually chronic, not painful, not associated with fever, and no cocci or other pathogenic microörganisms are present. Acute rheumatic infection especially if monarticular, or gonococcus arthritis occasionally confuse the diagnosis. Fungus infections also simulate tuberculosis. *3: Tumors:* These are important, since treatment for tuberculosis allows the tumor sufficient time to grow and metastasize. *4: Constitutional or digestive diseases:* These also may produce the clinical picture of tuberculosis. *5: Trauma:* Bursitis and tendon-sheath inflammation come in for differentiation.—*Bemerkungen über Fehldiagnosen bei chirurgischer Tuberkulose, M Jerusalem, Wien. klin. Wchnschr., May 1, 1924, xxxvii, 437*—(*H. S. W.*)

Toxic Changes in Surgical Tuberculosis.—In contrast to the majority of cases of pulmonary tuberculosis, it is very difficult in surgical tuberculosis to determine how much the local process has affected the body in general. Attempts were made to determine this by the urochromogen reaction, the red-cell sedimentation rate, changes in the blood picture, and skin tests. At the same time, blood uric acid determinations were made in cases of extensive purulent surgical tuberculosis. One group of patients showed uric acid values within normal limits. In a second group of cases with purulent fistulae, the values were below normal, being 2.3 mgm. per cent. In a third group with closed abscesses the values were within normal limit.—*Beitrag sur Analyse des Vergiftungsvorganges bei chirurgischer Tuberkulose, G. Kelemen, Arch. f. klin. Chir., 1925, cxxxv, 382.*—(*H. J. C.*)

Treatment of Surgical Tuberculosis.—Heliotherapy has been considered of little value in low, flat countries, where there is but little winter sunshine, but by the use of artificial-ray therapy, which produces the same congestion as that from heliotherapy, good results follow. The author used Bier constriction bands to produce congestion and combined this with the administration of iodine, since the constriction bands produce the same type of hyperemia as does heliotherapy. But, in this method one must care for the general as well as the local condition of the patient, for tuberculosis is a general and not a local disease. The red and infrared rays of the spectrum, rather than the ultraviolets, have the greatest effect. Upon following up patients who have passed through Hohenlychen, it was found that of 159 patients out for as long as nine years 9 had relapsed, and of those that had been away from the sanatorium for from three to nine years none had relapsed, showing that the relapses which occur usually set in within the first three years after discharge. In surgical tuberculosis, artificial-light therapy can produce absorption of necrotic bone and regeneration of perfectly normal bone in its stead. Surgery may effect healing of the local focus, but it cannot cure the patient's tuberculosis or his predisposition; so that light and open-air therapy should supplement operation and be continued for several months. Although the best medical opinion is against the use of heliotherapy in pulmonary tuberculosis, it has been used in these cases with gratifying results. In Hohenlychen the heliotherapeutic results have become so well recognized that short courses for nurses and physicians are given.—*Zehnjährhrige Tuberkulosetherapie in der Heilanstalt für äussere Tuberkulose in Hohenlychen, E. Kisch, Deutsche med. Wchnschr., May 23, 1924, l, 668.*—(*H. S. W.*)

X-Ray Treatment of Bone and Joint Tuberculosis.—There is no longer any doubt that X-ray therapy is helpful in bone and joint tuberculosis. But indications for this type of treatment, as opposed to immobilization with casts, are important. Röntgen therapy is indicated when the acute phases of the disease have subsided. It should absolutely not be used in early cases in which conditions are acute. The chronic, often suppurating, mixed-infection cases are by far the most likely to respond to X-ray treatment. Far-advanced disease, with or without pulmonary tuberculosis, should be considered a contraindication. Prognosis is good, especially in the case of the smaller joints, when treatment is carried out for a long time. If ankylosis has begun, the outlook is particularly favorable. Attention must be given to general measures at all times, and this therapeutic measure must be combined with ordinary orthopedic management.—*Zur Röntgenbehandlung der Knochen und Gelenkstuberkulose, J. Hass, Wien. klin. Wchnschr., May 1, 1924, xxxvii, 435.*—(*H. S. W.*)

Etiology and Treatment of Chronic Bone Tuberculosis.—Chronic inflammatory changes of the bones due to tuberculosis can exist without true histological tubercle. Recognition of the etiology in such cases is aided by the history and close observation of the condition of lymph nodes and lungs, and made certain by favorable results following specific tuberculin therapy. As adjuncts to tuberculin therapy in such cases the usual hygienic and climatic measures are

to be employed. Statistical evidence favors the assumption that there is a relation between late rickets and the later development of chronic bone inflammation. In cases of bone disease following rickets the following measures are of value: avoidance of heavy work, and treatment with light, phosphorus, codliver oil and strontium.—*Beitrag zur Aetiologie und Therapie der chronischen Gelenkerkrankungen, W. Alwens, München. med. Wchnschr., 1926, lxxiii, 436 and 489.*—(*E. R. L.*)

Cystic Bone Tuberculosis.—Aside from the multiple cystic tuberculosis of bone, described by Jüngling, which has a benign, almost symptomless course, without periosteal involvement, and predominates especially in young individuals and in the spongiosa of the bones of the hand and feet, there is another cystic form of bone tuberculosis, occurring especially in the large bones and differing from the former type. Two cases are reported, both with a progressive course. In one the localization was in the elbow joint, especially the olecranon, occurring in a woman 69 years of age. The other was in a man 59 years of age, with changes in the hip and the upper part of the femur, and with cystic rarefactions in the upper femur and in pelvic bone. Test excisions for malignant tumor led into a caseous bone cavity. In both cases there were periosteal changes.—*Zur Kenntnis der cystischen Form der Knochentuberkulose, H. Jessen, Beitr. z. Klin. d. Tuberk., 1924, lx, 96.*—(*H. J. C.*)

Origin and Treatment of Joint Tuberculosis.—Joint and bone tuberculosis is generally believed to be caused by a focus located elsewhere in the body, as the lymph nodes of the abdomen or mediastinum, which, during infancy and childhood, according to figures from various postmortem findings, are the most common sites of tuberculous lesions. The majority of cases occur during the first decade of life, as illustrated by the report of Whitman, in which 85 per cent of 1,259 cases of Pott's disease occurred during this period. It appears possible that the tonsil may be a source of infection, since examination of the tonsils in 40 cases of joint tuberculosis showed 32 infected with tuberculosis. In a series of 46 cases of joint tuberculosis in subjects of all ages, but half of them under ten years, pulmonary involvement occurred in 4. This seems to bear out the idea that joint and bone tuberculosis occurring secondarily confers a beneficial action on the lungs. In 27 of the 46 cases, however, there were very evident enlarged mediastinal and parabronchial lymph nodes in the roentgenogram, and it would appear that these were the source of joint infection. In cervical Pott's disease and tuberculous affections of the shoulder Metcalf is quoted as indicating the close statistical relationship between these conditions and cervical adenitis. The importance of roentgenograms of the chest in all cases of bone and joint tuberculosis is pointed out. If enlarged lymph nodes are demonstrable an attempt should be made to eradicate the focus by properly filtered X-rays. Such treatment causes shrinkage and fibrosis of the affected glands.—*Affections of the Respiratory System in Relation to Joint Tuberculosis, H. Keller, Med. J. & Rec., February 3, 1926, cxxiii, 169.*—(*E. H. K.*)

Sternocostoclavicular Tuberculosis.—When a large cold abscess of the right sternoclavicular region in a woman of forty-eight years failed to respond to aspiration and injections, cure was quickly obtained by radical operation. The extent of such lesions is always considerably greater than clinical examination indicates. Attention is called to the frequency of lesions, often very marked, of the inner side of the sternum.—*Tuberculose sterno-costo-claviculaire, Mouchet, Meeting, Soc. de Chirurgie de Paris, May 27, 1925, reported in Presse Méd., June 3, 1925, no. 44, 734.*—(*E. H. K.*)

Baron's Operation for Tuberculosis of Shoulder Joint.—The operation is an extraärticular arthrodesis of the shoulder joint obtained by means of a bisection of the humerus. The tuberculous end of the humerus is separated from the diaphysis, and the latter is wedged into the scapula. This produces complete fixation, without disturbance of the tuberculous tissue. The healing of the tuberculous process progresses rapidly, so that within 2 to 3 months the patient is free from pain, the musculature, which is atrophied, regenerates and in 4 to 5 months is functionating in a manner rarely attained by conservative treatment or resection. The permanent results are good, numerous cases revealing good function and healing after 3 years, so that the patient can return to this former occupation.—*Über die Operation der Schultergelenkstuberkulose nach Baron, E. Schulhof, Centralbl. f. Chir., 1925, lii, 1470.*—(*H. J. C.*)

Ankylosis of Spine in Pulmonary Tuberculosis.—A 41-year-old man, having suffered an earlier pulmonary tuberculosis of mild grade, developed a subacute inflammation of the vertebral column, with

marked disturbance of his general condition and disappearance of bony substance, which was designated as Poncet's disease.—*Ein Fall von Wirbelsäulenversteifung bei Lungentuberkulose, K. Siegfried, Ztschr. f. Tuberk., 1925, xliii, 109.*—(*H. J. C.*)

Paraplegia from Cold Abscess Following Albee Operation.—The case presented passed through several phases: appearance of paraplegia five weeks after Albee's operation; disappearance after fifteen months; reappearance after a month of advance; finally, considerable improvement in a few hours after the spontaneous rupture of a cold abscess into the intestine. This rapid disappearance of symptoms of paraplegia following opening of an abscess is well known but rare. The great frequency of cold abscess in tuberculous disease of the dorsal spine and its clinical latency are emphasized.—*Paraplégie pottique par abscès froid consécutive à une opération d'Albee, Froment, F. Delore and Jouve, Meeting, Soc. Méd. des Hôpitaux de Lyon, June 9, 1925, reported in Presse Méd., July 3, 1925, no. 53, 897.*—(*E. H. K.*)

Tuberculous Osteomyelitis of Tibia.—In a woman 79 years old there developed within six months a tumor of the lower leg which resembled sarcoma. It fluctuated, and on puncture yielded a reddish-brown fluid. The roentgen picture was not definite. Section revealed a primary tuberculosis of the marrow, which had spread to the spongiosa and cortex.—*Zur Differentialdiagnose der Osteomyelitis tuberculosa der Tibia, H. Kümmell, Jr., Beitr. z. Klin. d. Tuberk., 1925, lxi, 372.*—(*H. J. C.*)

Bilateral Renal Tuberculosis.—A woman with bilateral renal and ureteral and extensive visceral tuberculosis had her life definitely prolonged several months by nephrectomy of the kidney that had the greatest amount of disease and in which function was nil.—*Zur Kasuistik und Behandlung der Doppelseitigen Nierentuberkulose, W. Hoffmann, Klin. Wchnschr., July 28, 1925, iv, 1456.*—(*H. S. W.*)

Suppuration of Renal Pelvis Following Nephrectomy.—The cause of this frequent occurrence following nephrectomy for renal tuberculosis is considered to be the infected ureteral stump. Previous forms of treatment, as very high or very low ligature of the ureter, sterilization of the stump, by different methods, and total ureterectomy, have failed. Favorable results have been obtained by isolating the renal pocket and the ureter by encompassing the latter with a tube, the internal calibre of which corresponds to the external calibre of the ureter. Antiseptic injections are then employed in the tube. The time of removal of the tube varies according to the septic or aspetic healing of the nephrectomy wound. An average of thirty days was required for healing in nine of eleven cases.—*La suppuration de la loge rénale après néphrectomie pour tuberculose du rein et le traitement del' uretère tuberculeux, A. Dor, reported by J. Fiolle, Meeting, Soc. de Chirurgie de Marseille, April 6, 1925, reported in Presse Méd., June 6, 1925, no.. 45,753.*—(*E. H. K.*)

Tuberculosis of Rectum with Urethrorectal Fistula.—The case presented was that of a man of forty-two years who, following proctitis and the development of hemorrhoids, began to pass intestinal gas through the urethra. The existence of a urethrorectal fistula was demonstrated by irrigations. The establishment of an artificial anus brought about improvement in the secondary urinary infection, but the rectal lesions remained unchanged after four months and there was, in addition, considerable narrowing of the rectal ampulla. Transanal amputation of the infected portion of the rectum was therefore done with closure of the artificial anus one month afterward. Histological examination of the excised tissue confirmed the diagnosis of tuberculosis.—*Tuberculose du rectum avec fistule urêtrorectale et rétrécissment ampullaire, Santy, Meeting, Soc. d. Chirurgie d. Lyon, May 14, 1925, reported in Presse Méd., May 30, 1925, no. 43, 720.*—(*E. H. K.*)

Renal Tuberculosis in Hemophiliac.—Nephrectomy was performed in a hemophiliac for extreme hematuria of unilateral origin. No other abnormality could be found in the urine, and there were no other symptoms. Embolism caused death two days after operation. The kidney was found to be tuberculous macroscopically, and animal inoculation was positive for tuberculosis.—*Tuberculose rénale unilatérale à symptomatologie uniquement hémorragique chez une hémophile, Papin, Meeting, Soc. Française d' Urologie, June 15, 1925, reported in Presse Méd., July 8, 1925, no. 54, 920.*—(*E. H. K.*)

Renal Tuberculosis Treated Conservatively.—In a case of renal tuberculosis the patient preferred conservative treatment, consisting of sun-baths and rest-cure, combined wih 48 tuberculin injections. A year later the patient developed tuberculosis of the left epididymis. Cystoscopy at that time revealed an absence of the earlier positive

findings in the bladder and around the right ureter. Ureteral catheterization now revealed a clear and negative urine from both kidneys. The left epididymis and testes were removed and showed typical tuberculosis. It is believed that the original kidney tuberculosis was cured by the conservative treatment.—*Über einen Fall von konservativ geheilter Nierentuberkulose, W. Hofmann, Centralbl. f. Chir., 1925, lii, 1025.*—(*H. J. C.*)

Healing of Tuberculous Meningitis.—A case of diffuse meningitis in a patient, 33 years of age, in which the etiology was determined by smears and animal inoculation, is reported. Focal symptoms appeared during the sixth week, with facial, arm and leg paralysis, as well as a motor aphasia, after which the meningitis took on a remittent character. It was complicated by an encephalitis resulting from hemorrhage and softening. Secondary infection from the ear and nose, as well as a miliary tuberculosis, was excluded, although the possibility of a hematogenous dissemination from a pulmonary focus in the right hilum existed. The case tended toward healing and repeated lumbar punctures revealed favorable progress. Urotropin and iodine in large doses are recommended for trial. Unquestionably healed cases of tuberculous meningitis are reported in the literature 26 times, although the incidence is actually considered much higher than this. It is certain that a diffuse meningitis, when it is not part of a miliary tuberculosis and not complicated by a progressive pulmonary tuberculosis, or other prognostically unfavorable tuberculous manifestations, can actually heal.—*Kann die Meningitis tuberculosa heilen? A. Gehrcke, Beitr. z. Klin. d. Tuberk., 1925, lxi, 310.*—(*H. J. C.*)

Tuberculous Meningitis Simulating Epidemic Encephalitis.—Typical lesions of tuberculous meningitis were found at autopsy in a girl of 19 years who had been ill for four months with symptoms simulating, except in the terminal stages, those of epidemic encephalitis. These symptoms were somnolence at the onset, with ocular palsies and fever. Typical meningeal signs did not appear until near the end. On two occasions, presumably as a coincidence, there was brief symptomatic improvement following the intravenous injection of sodium salicylate—*Méningite tuberculeuse ayant simule une encephalite épidémique; amélioration temporaire considerable par la médication salicylée intraveineuse, P. Pagniez, J. Corby and Escallier, Meeting, Soc. Méd. d. Hôpitaux d. Paris, May 29, 1925, reported in Presse Méd., June 6, 1925, no. 45, 750.*—(*E. H. K.*)

Tuberculous Meningitis Following Trauma.—A 2½ year girl, who suffered a kick from a horse, sustained a defect in the cranium and dura. The child had been in close association with a tuberculous child, 6 years of age. The onset of disease was afebrile, but soon fever developed, and 10 weeks after an operation epileptiform attacks occurred. Within 16 weeks there developed symptoms of meningitis, and 4 weeks later death.—*Zur traumatischen Tuberkulose, K. Terplan, Zeitschr. f. Tuberk., 1924, xli, 44.*—(*H. J. C.*)

Associated Meningococcus and Tuberculous Meningitis—Two cases, both of adults, illustrating this condition, are reported. The first had a turbid spinal fluid with polymorphonuclear cells predominating. There were numerous intracellular and extracellular meningococci. Autopsy revealed lesions of a mixed character in the brain, there being evidence of both a purulent and granulomatous meningitis. There were, in addition, pulmonary and hepatic tuberculosis, and caseous tubercles in the left kidney and in the suprarenals. In the second case the spinal fluid was purulent, and meningococci were demonstrated. At autopsy there was evidence of a mixed meningitis, and there was found a pleural effusion, and a calcified tubercle at the left apex.—*Association de méningites cérébro-spinale et tuberculeuse, Chalier and Schoen, Meeting, Soc. Méd. des Hôpitaux de Lyon, May 12, 1925, reported in Presse Méd., May 30, 1925, no. 43, 721.*—(*E. H. K.*)

Pulmonary Tuberculosis and Lupus of Both Hands.—In a case of pulmonary tuberculosis in a man 40 years of age there was the exceptional localization of lupus on both hands. The patient was in the habit of wiping his moustache, contaminated with sputum, first with the right and then with the left hand, thus accounting for the bilateral involvement.—*Lungentuberkulose und Lupus, E. Ruediger, Beitr. z. Klin. d. Tuberk., 1925, lx, 269.*—(*H. J. C.*)

Treatment of Lupus with Pyotropin.—"Pyotropin" is a useful remedy in the treatment of lupus, but as a corrosive only and not as a specific remedy. Experience so far by no means justifies the wide publicity and excessive claims that have been made for it.—*Lupus und Pyotropin, V. Nagel, Deutsche med. Wchnschr., July 24, 1925, li, 1235.*—(*H. S. W.*)

Treatment of Lupus with Pyotropin.—Good results were obtained from the pyotropin treatment of lupus. Even though the period of observation was admittedly short it is believed that the results indicate that there is no harm in its use.—*Zur Pyotropinbehandlung des Lupus, H. Schneider, Ztschr. f. Tuberk., 1925, xliii, 214.*—(*H. J. C.*)

Treatment of Lupus Vulgaris by Ignipuncture.—Light fails to cure deeper lesions; X-rays and radium rays do not reach the seat of the disease, nor do caustic or local removal of the diseased tissue. Multiple ignipuncture, produced by a hot needle gives very satisfactory results. The needle, red but not white-hot, is pushed repeatedly and rapidly into the area of lupus until the entire focus has been heated. Pain is but slight. After ten to fourteen days the dry scab falls off and reveals usually healthy young epidermis.—*Die Heilung des Lupus vulgaris durch multiple Ignipunktur, Kromayer, Deutsche med. Wchnschr., July 31, 1925, li, 1281.*—(*H. S. W.*)

High Leucocytosis in Tuberculosis.—In this case a man aged sixty, with a diagnosis of fibrous, practically healed tuberculosis of the lung associated with numerous small abscesses lower in the same lung, had a very high leucocyte count of 122,000, the latter being attributable to the "mixed infection."—*Ein Fall hochgradiger Leukozytose bei mischinfizierter Lungentuberkulose, O. Luze, Wien. klin. Wchnschr., August 6, 1925, xxxviii, 886.*—(*H. S. W.*)

Treatment of Tuberculosis.—A review is made of certain general therapeutic measures employed against infectious diseases, as vaccinotherapy, serotherapy chemotherapy, and "leucotherapy," and of the utilization of these procedures in combating tuberculosis. In general, failure has been met with, though chemotherapy has had slight success in external forms of tuberculosis, and vaccinotherapy and tuberculin therapy have accomplished just enough to warrant further study. In view of the good results obtained by the traditional therapeutic methods of rest, proper food, fresh air and artificial pneumothorax in selected cases, it would appear that our bacteriological preoccupations have separated us too much from attempts to modify the organic soil. In answer to the question as to whether there really is a soil that is predisposed to tuberculosis, it is pointed out that certain types of persons, notably those of excessive height, those with ruddy complexion and delicate skin, and those with a special dyschromia, as black hair on the head and red hair elsewhere, those with hyperthyroidism, and those with instability of the sympathetic nervous system, are notoriously susceptible to the disease. In addition, puberty, pregnancy and lactation furnish fertile soil for the development of tuberculosis. The immediate predisposing factors are generally poor hygienic conditions, overwork, poor food and digestive troubles, which bring about a general debility for which a cause is sought in hypoacidity of the secretions, decalcification and general demineralization. How may the soil be changed and calcium and other minerals deposited? It may be done by improving the general condition, as by the action of light and of codliver oil and by the traditional methods of fresh air, proper food, and rest.—*La problème de la tuberculose et l'orientation thérapeutique, F. Bezançon, Rev. Belge d. l. Tuberc., April & May, 1925, nos. 4 & 5, 101 & 129.*—(*E. H. K.*)

Dietetic Treatment of Tuberculosis.—Conventional medicine suffers from the domination of morphological ideas and over emphasis of the microbial factor in the etiology of disease. Gerson has recently reminded the medical profession of the part played by nutrition in defense against disease. The Gerson method has been investigated with favorable results. The most powerful weapons against tuberculosis are physical and dietetic management. The results of many observers have shown that metabolism is greatly increased in tuberculosis. The gas exchange may pass that of the normal person by 86 per cent. Robin and others have proved that a demineralization occurs in the course of the disease. The important elements of a diet calculated to aid in the cure of tuberculosis are protein, fat and an abundance of vitamines and certain minerals. A number of food articles are prohibited in the Gerson diet. These are common salt, conserves, smoked and pickeled meat, sausage and ham, smoked or salted fish, vinegar and bouillon cubes. The following are recommended, but are to be used sparingly: Fresh meat (up to 500 gm. a week), fresh fish, internal organs, such as brain, liver, etc., pepper, Liebig's meat extract, beer and wine. Coffee, tea and cocoa are to be used only in amount sufficient to color milk. On the other hand the following are to be taken in large quantity: Milk, in fresh or modified form, salt-free butter, fruits of all kinds, salads and vegetables in great variety, breads, eggs, cereals, sugar and olive oil. Vegetables in profusion, particularly the aromatic type, are used to make up for the prohibition of salt. The only medicaments recommended are phos-

phorized codliver oil and certain mineral preparations. The aim should be to supply an average of 45 to 50 calories per kilo. divided as follows for a 60-kilo patient; protein 90 gm., fat 162 gm., and carbohydrate 222 gm. The proportion of these food substances is 1.5:2.7:3.7. The mineral preparation recommended contains calcium, magnesium, strontium, sodium, bismuth and aluminum as cations, and the following anions, phosphate, sulphate, thiosulphate, silicic acid, carbonate, bromide, salicylate and lactate. A special effort is made to keep down the sodium chloride intake and increase the intake of other minerals.—*Ueber Versuche, schwere Formen der Tuberkulose durch diätetische Behandlung zu beeinflussen, F. Sauerbruch, A. Herrmannsdorfer and M. Gerson, München. med. Wchnschr., January 8, 1926, lxiii, 47.*—(*E. R. L.*)

Minerals in Dietetic Treatment of Tuberculosis.—The stress laid in the Gerson diet regulations on restriction of salt raises again the question of chloride metabolism in tuberculosis. The output of chlorides is generally increased in tuberculosis. In spite of this, however, the increased respiration in tuberculosis tends to dry out the body. The increased excretion of chlorides is therefore an advantage. It has been claimed, moreover, that salt increases cell metabolism, which tends to be excessive in tuberculosis. Empirically, it has been found that restriction of salt influences the course of tuberculosis favorably. The favorable action of the mineral combination recommended by Gerson is not due to an alkalizing action. "Mineralogen" itself is weakly acid. Codliver oil is not alkalizing. The average pH value of 24-hour specimens of urine from 32 patients on the Gerson diet was 5.9. The average NaCl elimination was 2.7 gm. In patients progressing favorably the urine pH tended to be low, and the monophosphates exceeded the diphosphates. The alkaline reserve of the blood varied from 44 to 51 per cent. Excellent results were obtained in the treatment of skin tuberculosis, and good results with bone and visceral tuberculosis. Less favorable results occurred in pulmonary tuberculosis, although even in this case increase in weight and reduction in fever and rapidity of pulse, and decrease in sputum often took place soon after the beginning of the Gerson treatment. In both skin and bone tuberculosis increase in the activity of the disease was noticed shortly after institution of the dietary treatment, but this was followed by recession of symptoms and a marked tendency to healing and scar formation. It is too early to tell what elements of the dietary programme are most responsible for the favorable results, but it is certain that the mineral control plays an important part.—*Ueber Tuberkulosebehandlung durch diätetische Umstellung im Mineralbestande des Korpers, A. Herrmannsdorfer, München. med. Wchnschr., January 15, 1926, lxxiii, 108.*—(*E. R. L.*)

Sanatorium Dietaries.—But little of value can come from the overfeeding regimen that has been so common in sanatoria for the treatment of tuberculosis. A patient at rest, but on the same diet which he had while doing physical work, is being somewhat overfed, and attention should be given to this factor as well as to height, weight, amount of disease, etc., in determining an adequate dietary, which should be rich in albumin.—*Zur Krankenverköstigung in Tuberkulose-Anstalten, H. Poindecker, Wien. klin. Wchnschr., May 1, 1924, xxxvii, 442.*—(*H. S. W.*)

Post-Sanatorium Care of Tuberculosis.—The public must be recruited more and more in the tuberculosis campaign. The ambulant cases should be observed every few days at a tuberculosis clinic. If a practising physician expresses a desire to continue the specific treatment initiated in the sanatorium, he should be given permission for this. As a conclusion to the sanatorium cure the continuation of treatment in the clinic is superior to treatment in an ambulatorium.—*Die Bekämpfung der Tuberkulose durch Sonderkrankenhäuser, E. Haeger, Beitr. z. Klin. d. Tuberk., 1924, lix, 447.*—(*H. J. C.*)

Segregation of Cases in Sanatoria.—The reacting power of the infected body can change, and especially susceptible is the organism during the primary stage of tuberculosis, yet it is not known how long this hypersensitiveness lasts. Even in the secondary stage the organism is still somewhat sensitive, while in the tertiary stage it can be viewed as insensitive. With the increase of tuberculous tissue in the body the immunity toward the disease increases. In tertiary phthisis exogenous reinfection plays no rôle, and segregation of such cases in a sanatorium is, therefore, not necessary. With diminished resistance of the infected but inactive tuberculosis cases, exogenous reinfection can develop, and, therefore, individuals not definitely infected should not be allowed close association with severe tuberculosis. In addition, such persons should, by proper nutrition, have their resistance maintained, or, as far as possible, increased. The grave danger of transmission is not significant for the adult, but the younger the individual the more susceptible

is he to reinfection. Without doubt the most common exogenous reinfection occurs in the nursling, and it is less frequent in the small child, while with increasing age it diminishes. In children, therefore, a segregation of the open from the closed tuberculosis cases is absolutely essential.—*Sind offene und geschlossene Tuberkulosen in der Heilstätte zu trennen? H. Grass, Beitr. z. Klin. d. Tuberk., 1924, lix, 362.*—(*H. J. C.*)

Workshops for Tuberculous.—No proposed solution of the tuberculosis problem can afford to ignore economic and industrial factors. Bardswell attempts to describe the work developed at the Spero Leather Factory in Hatton Garden, Holborn, London. All of its workers have been sufferers from pulmonary tuberculosis. The following summary is made from an experience of three years: *1:* The organization of employment for tuberculous persons is a practical proposition. Their training for a skilled trade, however, is not generally possible. The trade chosen should not be a skilled one, but rather one demanding the minimum of training in which the output of the workers can be assisted by the use of simple machinery. *2:* Medically speaking, tuberculous persons working in a city factory, under conditions such as can be seen in this workshop, do very well. As a means of aftercare, the success of the factory is fully proved. *3:* A factory for tuberculous persons wants a certain and constant market for its products. *4:* The factory must be subsidized.—*Workshops for the Tuberculous, N. D. Bardswell, Brit. J. Tuberc., January, 1926, xx, 25.*—(*J. C. D.*)

Principles Underlying Village Settlements.—Physicians suffering from pulmonary tuberculosis form the nucleus of a Village Settlement. They live in the environment best suited to their condition. If this idea is expanded to embrace not only the members of the medical profession but also others less fortunately placed in the social scale, we have the Village Settlement. The heads of all the departments, such as the head of the workshop, should be expatients, because they can with difficulty obtain employment outside, and the village environment becomes their world. They have an incentive and impulse to do good work which those brought in casually from the outside lack, and much more reason to make the settlement their home, with all that implies. They have a common bond, and a cohesion soon develops, which, despite petty differences, withstands destructive criticism. The same things are true of sanatorium physicians. Let the tuberculous man be the one who is given the opportunity of shouldering responsibility and showing initative. Thus the spirit of the wounded man triumphs over adversity.—*Some of the Principles Underlying Village Settlements for the Consumptive, P. C. Varrier-Jones, Brit. J. Tuberk., January, 1926, xx, 11.*—(*J. C. D.*)

Irritation Treatment of Tuberculosis.—The use of sunlight, air and baths is established in the treatment of surgical tuberculosis. Nonspecific protein injections and also injections of such preparations as *Yatrencasein* have been used with good results. They stimulate focal scarification which follows focal inflammation. Yatren also produces good results when applied locally to tuberculous ulcers, abscesses, etc., but not when applied to fistulae. After joint resection, injections of *Lipatren* will probably be found helpful. The injection of Yatren compounds does the body no harm.—*Reiztherapie bei chirurgischer Tuberkulose, E. Rüscher, Deutsche med. Wchnschr., May 23, 1924, l, 684.*—(*H. S. W.*)

Tuberculin Treatment of Tuberculosis.—After specific treatment with tuberculin a large number of patients showed improvement up to one year. Of 190 Turban I cases 63 per cent were improved, 29 per cent were unchanged and the remaining 7 per cent did badly. Of 87 Turban II patients 24 per cent were improved, 54 per cent were unchanged and 30 per cent became worse. Of 13 patients in late stages none were improved and 77 per cent did badly. The Pirquet reaction was negative in 44 of 359 cases, but clinically these were thought to be tuberculous. Two weeks later, when retested, 10 per cent of these negative reactors had become positive. There was a much higher incidence of general tuberculin reactions in those with advanced disease than in those in earlier stages. The milder the general reaction the better the prognosis.—*Ueber spezifische Behandlung der Lungentuberkulose, C. Schilling, Deutsche med. Wchnschr., May 23, 1924, l, 681.*—(*H. S. W.*)

Methylic Antigen as Adjuvant in Treatment of Tuberculosis.—In laboratory animals rendered tuberculous, alcoholic antigen, prepared according to the method of Boquet and Nègre, using methyl alcohol, produces no manifestation of hypersensitiveness. It is well tolerated and the slight elevations of temperature it produces are of short duration. It slows the advance of the disease, and localizes lesions which are less confluent and show a tendency to fibrotic organization. At Bligny 142 tuberculosis patients were treated with this antigen, and

of these, 55 have been followed from six to fourteen months. The product is well tolerated, and produces slight or no general reaction, while elevations of temperature are short and slight. In febrile patients, however, and those with advancing disease, the reaction may be considerable, and dosage must be accordingly lessened and increased but slowly. The beneficial action of the antigen is manifested by a marked lessening of activity or an arrest of the disease, and by a drying up and stabilization of the tuberculous lesions which favors the establishment of fibrosis. Sufficient dosage must be used, and the treatment continued over a sufficiently long period. At Bligny injections were made every day or every two days for an average of five and a half or six months. The first series received an initial dose of 0.005 cc., which was gradually increased to 0.5 cc. Later, when the antigen was found to be well tolerated, dosage was begun at 0.05 cc. of equal parts of antigen and normal salt solution or of the pure antigen, and gradually increased to 1 cc. In contrast to tuberculin this antigen may be used generally in the treatment of tuberculosis, because, when used as described, this bacillary extract appears to be beneficial in practically all cases. This product appears to be the best of those intended to assist in the cure of tuberculosis. Its exact value as a therapeutic adjuvant can only be determined by further observations and the test of time.—*L'antigène méthylique comme adjuvant dans la thérapeutique de la tuberculose, L. Guinard, Presse Méd., July 4, 1925, no. 53, 889.*—(*E. H. K.*)

Treatment of Pulmonary Tuberculosis with Boquet-Nègre Antigen.—Much first maintained that the fats of tubercle bacilli possessed antigenic properties, which was verified by Boquet and Nègre. Kovats found that the antigen of Boquet and Nègre had therapeutic value. The preparation of the antigen *BNA*, as well as the numerous animal experiments leading to its use in human tuberculosis, are recorded. It is concluded that *BNA* can be used to good effect in pulmonary tuberculosis. Local and focal reactions are not observed. Even advanced cases can be treated without danger.—*Das Boquet-Nègresche Antigen in der Therapie der Lungentuberkulose, F. v. Kovats, Ztschr. f. Tuberk., 1925, xliii, 468.*—(*H. J. C.*)

Treatment of Tuberculosis with Ektebin.—Ektebin is a tuberculin. When applied *à la Moro* as a therapeutic medium in 13 patients with tuberculosis of the lungs, local reactions uniformly occurred. In a general way a large number of the patients appeared to improve, but this could well be attributed to the general sanatorium regimen. The product is a good diagnostic medium, and may possibly have a place in the treatment of certain forms of superficial tuberculosis. It, however, is not without danger, and should be used only by specialists who understand all the possibilities of a tuberculin reaction.—*Beobachtungen bei der Ektebin-Behandlung der Lungentuberkulose, P. Stein, Wien. klin. Wchnschr., May 1, 1924, xxxvii, 448.*—(*H. S. W.*)

Autopyotherapy in Tuberculosis.—Experience has shown that an autovaccine, prepared by homogenization of the sputum, contains more of the harmful bacteria than a bacterial autovaccine, and preserves a maximum of antigenic properties. It is supposed that a more specific antibacillary and antitoxic vaccine is thus produced, since different tuberculous lesions may be due to bacilli different in type, activity and toxicity, and the associated microörganisms may likewise vary in a similar manner. The method of homogenization of the sputum is described in detail. Forty-nine tuberculous patients were treated with vaccine prepared in this manner. All had positive sputum, 29 had active disease, and 20 had chronic disease. In the first group of 29 cases there were 6 "cures," 4 markedly improved, 6 improved and 13 unimproved. In the second group there were 8 "cures," 9 markedly improved, and 1 improved, and 2 unimproved. Reaction is always obtained in those that are improving. Various types of pyotherapy are described.—*Essais d'autopyothérapie des affections pulmonaires et spécialement de la tuberculose, G. Therasse, Rev. Belge d. l. Tuberc., May, 1925, no. 5, 117.*—(*E. H. K.*)

Lipatren Treatment of Surgical Tuberculosis.—Lipatren A and B were used for the treatment of surgical tuberculosis. There were treated bone and joint, lymph-node, mesenteric and peritoneal tuberculosis, regardless of whether mixed infection was present or not, and without attention to the existing pulmonary process. Local surgical and orthopedic treatment was also used. In joint tuberculosis autogenous blood injections, 5 to 10 cc., into the joint were made. After every series of lipatren treatments a pause of one to two months occurred. Of the cases without mixed infection two-thirds were healed by lipatren A; the remainder were improved. The mixed-infection bone and joint tuberculosis cases were treated with lipatren B. Dosage was more cautious, since this had a more irritating effect. The healed cases did not exceed

40 per cent in these, but in most cases the process was arrested. In abdominal tuberculosis a combined surgical (laparotomy and camphor oil) and lipatren treatment was used. Of 12 cases 11 were healed.—*Zur Reiztherapie der chirurgischen Tuberkulose, V. C. Irk, Beitr. z. Klin. d. Tuberk., 1925, lxi, 297.*—(*H. J. C.*)

Injection of Exudate as Aid to Artificial Pneumothorax.—In view of the fact that the usual exudates occurring in artificial pneumothorax have a favorable influence on pulmonary tuberculosis, an experiment was tried in a pneumothorax case which did not develop an exudate. This patient was given an injection of an exudate containing tubercle bacilli obtained from another pneumothorax case. There resulted highly acute febrile exudative pleuritis. In the course of the disease a previously subfebrile temperature finally returned to normal, and it is believed that in this case a definite healing effect was observed.—*Künstliche Erzeugung von Exsudaten bei Pneumothorax, H. Maendl, Beitr. z. Klin. d. Tuberk., 1925, lxi, 316.*—(*H. J. C.*)

Treatment of Tuberculosis by Increasing Blood Uric Acid.—A century ago attention was called to the rarity with which tuberculosis occurs in the presence of gout. This fact has led a number of investigators to study the effect of a high purine diet on tuberculosis. A substance called *Acurogen*, consisting essentially of meat extractives, has been introduced to facilitate the purine treatment. Preliminary trial on a few patients has given Padel sufficiently favorable results to warrant a more extensive investigation of the effect of an increase of uric acid in the blood on tuberculosis.—*Ueber Versuche der Tuberkulosebehandlung durch künstliche Anreicherung der Harnsäure im Blut, G. Padel, München. med. Wchnschr., March 12, 1926, lxxiii, 444.*—(*E. R. L.*)

Sulphurous Thermal Cure of Pulmonary Tuberculosis.—An attempt is made to estimate, from a conservative standpoint, not the immediate results, usually good, but the later results of this therapy. Over 200 supposedly tuberculous patients have been treated at Cauterets since 1912, most of whom have been followed three to four years, some ten to twelve years. If those with doubtful diagnosis be eliminated, there are left 85 definitely tuberculous patients, classified as follows: *1. Fibrocaseous forms:* This group of 24 patients did not really receive the sulphurous thermal treatment during their stay, as it was thought to be too risky. *2. Fibrous forms:* This group of 23 patients showed 9 improved, 13 stationary and 1 worse. *3. Apical pleuritis:* Of 15 patients 11 were improved and 4 stationary. Fourteen of these were young women or girls. They gained weight and became less susceptible to cold; often pleural friction sounds disappeared and, likewise, roentgenographic veils. *4. Residual pleuritis:* Of 5 patients 3 improved and 2 remained stationary. *5. Abortive tuberculosis:* Among 16 patients there were 12 improved, 3 stationary and 1 worse. *Summary:* It is true that these favorable results were obtained in the "good" forms of tuberculosis, and in apyretic patients. It is probably also true, although not shown statistically, that results are inferior to those after prolonged sanatorium cure; on the other hand, they were obtained in a very much shorter space of time, three or four weeks, repeated at irregular intervals by patients, who, as a rule, are not very amenable to prescribed rules of life. No serious accident of any sort occurred in a single case. This form of treatment is thought to be valuable as a prophylactic measure in children of tainted or doubtful heredity, narrow-chested, with cervical adenitis and adenoids, and subject to frequent colds; also, in those convalescent from measles, pertussis and grippe. In the torpid forms of tuberculosis, especially apical pleurisy, or small sclerotic lesions, the treatment is a useful adjuvant or substitute for a rigid sanatorium regimen. All acute, subacute or progressive forms are unsuited to it. The principal "stations" are situated in the Alps and Pyrenees, especially the latter (Cauterets, Luchon, Eaux-Bonnes, Ax, Amélie, Le Vernet, Bagnères-de-Bigorre). Cauterets is at 930 metres altitude. At Amélie and Le Vernet the cure may be taken in winter.—*La cure thermale sulfureuse des tuberculoses pleuro-pulmonaires, A. Corone, Rev. d. l. Tuberc., August, 1925, vi, 488.*—(*A. P.*)

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of these, 55 have been followed from six to fourteen months. The product is well tolerated, and produces slight or no general reaction, while elevations of temperature are short and slight. In febrile patients, however, and those with advancing disease, the reaction may be considerable, and dosage must be accordingly lessened and increased but slowly. The beneficial action of the antigen is manifested by a marked lessening of activity or an arrest of the disease, and by a drying up and stabilization of the tuberculous lesions which favors the establishment of fibrosis. Sufficient dosage must be used, and the treatment continued over a sufficiently long period. At Bligny injections were made every day or every two days for an average of five and a half or six months. The first series received an initial dose of 0.005 cc., which was gradually increased to 0.5 cc. Later, when the antigen was found to be well tolerated, dosage was begun at 0.05 cc. of equal parts of antigen and normal salt solution or of the pure antigen, and gradually increased to 1 cc. In contrast to tuberculin this antigen may be used generally in the treatment of tuberculosis, because, when used as described, this bacillary extract appears to be beneficial in practically all cases. This product appears to be the best of those intended to assist in the cure of tuberculosis. Its exact value as a therapeutic adjuvant can only be determined by further observations and the test of time.—*L'antigène méthylique comme adjuvant dans la thérapeutique de la tuberculose, L. Guinard, Presse Méd., July 4, 1925, no. 53, 889.*—(*E. H. K.*)

Treatment of Pulmonary Tuberculosis with Boquet-Nègre Antigen.—Much first maintained that the fats of tubercle bacilli possessed antigenic properties, which was verified by Boquet and Nègre. Kovats found that the antigen of Boquet and Nègre had therapeutic value. The preparation of the antigen *BNA*, as well as the numerous animal experiments leading to its use in human tuberculosis, are recorded. It is concluded that *BNA* can be used to good effect in pulmonary tuberculosis. Local and focal reactions are not observed. Even advanced cases can be treated without danger.—*Das Boquet-Nègresche Antigen in der Therapie der Lungentuberkulose, F. v. Kovats, Ztschr. f. Tuberk., 1925, xliii, 468.*—(*H. J. C.*)

Treatment of Tuberculosis with Ektebin.—Ektebin is a tuberculin. When applied *à la Moro* as a therapeutic medium in 13 patients with tuberculosis of the lungs, local reactions uniformly occurred. In a general way a large number of the patients appeared to improve, but this could well be attributed to the general sanatorium regimen. The product is a good diagnostic medium, and may possibly have a place in the treatment of certain forms of superficial tuberculosis. It, however, is not without danger, and should be used only by specialists who understand all the possibilities of a tuberculin reaction.—*Beobachtungen bei der Ektebin-Behandlung der Lungentuberkulose, P. Stein, Wien. klin. Wchnschr., May 1, 1924, xxxvii, 448.*—(*H. S. W.*)

Autopyotherapy in Tuberculosis.—Experience has shown that an autovaccine, prepared by homogenization of the sputum, contains more of the harmful bacteria than a bacterial autovaccine, and preserves a maximum of antigenic properties. It is supposed that a more specific antibacillary and antitoxic vaccine is thus produced, since different tuberculous lesions may be due to bacilli different in type, activity and toxicity, and the associated microörganisms may likewise vary in a similar manner. The method of homogenization of the sputum is described in detail. Forty-nine tuberculous patients were treated with vaccine prepared in this manner. All had positive sputum, 29 had active disease, and 20 had chronic disease. In the first group of 29 cases there were 6 "cures," 4 markedly improved, 6 improved and 13 unimproved. In the second group there were 8 "cures," 9 markedly improved, and 1 improved, and 2 unimproved. Reaction is always obtained in those that are improving. Various types of pyotherapy are described.—*Essais d'autopyothérapie des affections pulmonaires et spécialement de la tuberculose, G. Therasse, Rev. Belge d. l. Tuberc., May, 1925, no. 5, 117.*—(*E. H. K.*)

Lipatren Treatment of Surgical Tuberculosis.—Lipatren A and B were used for the treatment of surgical tuberculosis. There were treated bone and joint, lymph-node, mesenteric and peritoneal tuberculosis, regardless of whether mixed infection was present or not, and without attention to the existing pulmonary process. Local surgical and orthopedic treatment was also used. In joint tuberculosis autogenous blood injections, 5 to 10 cc., into the joint were made. After every series of lipatren treatments a pause of one to two months occurred. Of the cases without mixed infection two-thirds were healed by lipatren A; the remainder were improved. The mixed-infection bone and joint tuberculosis cases were treated with lipatren B. Dosage was more cautious, since this had a more irritating effect. The healed cases did not exceed

40 per cent in these, but in most cases the process was arrested. In abdominal tuberculosis a combined surgical (laparotomy and camphor oil) and lipatren treatment was used. Of 12 cases 11 were healed.—*Zur Reiztherapie der chirurgischen Tuberkulose, V. C. Irk, Beitr. z. Klin. d. Tuberk., 1925, lxi, 297.*—(*H. J. C.*)

Injection of Exudate as Aid to Artificial Pneumothorax.—In view of the fact that the usual exudates occurring in artificial pneumothorax have a favorable influence on pulmonary tuberculosis, an experiment was tried in a pneumothorax case which did not develop an exudate. This patient was given an injection of an exudate containing tubercle bacilli obtained from another pneumothorax case. There resulted highly acute febrile exudative pleuritis. In the course of the disease a previously subfebrile temperature finally returned to normal, and it is believed that in this case a definite healing effect was observed.—*Künstliche Erzeugung von Exsudaten bei Pneumothorax, H. Maendl, Beitr. z. Klin. d. Tuberk., 1925, lxi, 316.*—(*H. J. C.*)

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Surgical Treatment of Pulmonary Tuberculosis.—The inability to establish a pneumothorax, or its failure to check the progress of tuberculosis because of adhesions preventing satisfactory collapse in over half the cases otherwise suitable, has led to the introduction of other more radical surgical procedures. *Extrapleural thoracoplasty:* Next to a satisfactory pneumothorax, this is the most valuable procedure for placing the lung at rest. Credit for introducing a surgical procedure of unquestionable value and low mortality in properly selected cases belongs to Brauer and Sauerbruch. The latter emphasizes the importance of a vertical collapse and resecting the ribs close to the transverse processes. Sauerbruch, if some fibrosis is present, usually removes 8 cm. of rib; but, if little, 12 cm. or more. Brauer removes 12 to 16 cm. or more in order to permit the scapula to lie deep in the thorax. The sign of a well performed thoracoplasty is to be able to demonstrate the vertebral border of the scapula lying in front of the vertebral ends of the resected ribs. Brauer's modern "subscapular-paravertebral resection" differs very much from the old Brauer-Friedreich operation, and is very similar to that of Sauerbruch except for a longer resection beneath the scapula. Brauer does not remove the eleventh rib, nor the first if the apex shows retraction. The operation should be done under local anesthesia. Anesthetization of the eleventh to fifth intercostal nerves is not difficult, but the upper may require preliminary exposure. Anxious patients may be given some ethyl-chloride gas or oxygen, especially to complete the removal of the first rib, which is often painful. The anesthetic should not be injected too close to the vertebral column, because experiments by Matson and Plenk, using a gentian-violet solution, have shown that the injected fluid may pass along the perineural lymph spaces to the spinal dura with considerable ease, and even along the sheath of the *rami communicantes* to the sympathetic ganglia. It is desirable to wait 20 minutes for the local anesthetic to act, and to precede this by a hypodermic injection of morphine one-half hour before. The first stage of the operation, which consists in removing the lower six ribs, except the twelfth, should not consume over thirty minutes, and the second stage forty minutes. Previous preparation and moral support are important. Even more important is the after-care. Enough opiate should be given to relieve pain and excessive coughing, but coughing for drainage of sputum about once every four hours should be encouraged, the operated side being supported by a nurse. Rarely should the operation be done in one stage, as Brauer has shown a reduction from 27 per cent to 4 per cent mortality by making two stages. Before the second stage is attempted careful physical and roentgenological examinations must be made. The essential indication for a complete thoracoplasty is chronic phthisis, essentially unilateral and productive, with or without cavity formation, provided the patient is in good general condition and attempts to establish pneumothorax have been fruitless. The exudative types give the poorest results, and the presence of large cavities is also less propitious. Interference with heart function and respiration by retraction of the mediastinum is an indication. On the other hand, thoracoplasty is contraindicated in acute, rapidly progressive phthisis. The requirements as to the opposite lung are more rigid than for pneumothorax, although when one lung has been largely destroyed and compensatory emphysema has developed in the other a more liberal attitude is justified. The results of a good thoracoplasty in properly selected cases show approximately the same percentage of ultimate recoveries as for a satisfactory pneumothorax, namely, 40 per cent, with 30 per cent improved and 30 per cent early or late deaths. However, one is not justified in advising thoracoplasty in preference to pneumothorax. A patient who will prematurely abandon pneumothorax treatment will also abandon the after-care so essential for success with thoracoplasty. Nor is it true that stretching or burning adhesions, if proper judgment is used, is more dangerous than thoracoplasty. Moreover, a thoracoplastic collapse is never as good as a satisfactory pneumothorax, and the lung is irrevocably put out of function which in many cases it might eventually resume with pneumothorax. It must be remembered that the pneumothorax successes do not have occasion to be seen at surgical clinics, as do the failures. *Phrenicotomy and Phrenico-Exairesis:* Phrenic-nerve resection was first done by Stuertz in order to paralyze the hemidiaphragm and place the lower part of the lung at rest. The lung volume may diminish one-fourth or more. Later Felix showed that an accessory phrenic nerve was present in 25 to 35 per cent of cases, passing with the subclavius nerve almost to that muscle and joining the phrenic farther down. He recommended twisting out the nerve after cutting it, to break these accessory branches. Matson and Plenk, in the dissection of over 100 cases, have found 16 types of phrenic combinations with the cervical nerves. At most, phrenic-nerve resection is an auxiliary procedure for pneumothorax and thoracoplasty, even though extraordinary temporary results have followed it alone in a few in-

stances. It is not entirely without danger, and should not be attempted without a thorough topographical anatomical knowledge of the neck and qualified assistants. *Extrapleural pneumolysis (with fills):* This operation seems to be of only limited value, chiefly because there is no satisfactory substance to use as a permanent "fill," and is probably applicable only to a few selected cases of apical cavity which have failed to close after thoracoplasty. *Intrapleural pneumolysis:* In many cases of artificial pneumothorax, closure of cavities is interfered with by string-like and band-like adhesions to the chest wall. The majority of these, if not too firmly organized, can be stretched or separated and a satisfactory closure of the cavity effected with patient procedure, gradually increasing the intrapleural pressure. In other cases burning through the adhesions with a galvanocautery inserted through the chest wall and operated under thoracoscopic control is to be considered. This procedure requires great delicacy of technique and thorough cadaver experience. Stretched out portions of lung resemble adhesions and may be contained within them. The coughing test is useful in recognizing the presence of lung tissue. *General applicability of collapse measures:* Of 7,000 patients in the authors' service between 1910 and 1923, 600 (8.5 per cent) received pneumothorax, most of them far-advanced cases; the authors think that more of the moderately advanced and fewer of the far advanced should have been so treated. The end-results in 92 partial-collapse cases with a good contra-lateral lung have been so poor, that the authors conclude that it is better to abandon a poor pneumothorax in favor of a thoracoplasty in such cases. According to their experience, 10 per cent of sanatorium admissions require pneumothorax and about 2 per cent thoracoplasty, a somewhat lower estimate than Sauerbruch's. Tuberculosis specialists and surgeons should, if possible, spend some time in a hospital or sanatorium prepared to teach this special branch of surgery. The ideal condition is that which exists at Vejlefjord Sanatorium, Denmark, where the chief physician (formerly Saugman, now Gravesen) is also an expert surgeon, and the operation is performed under the most favorable hygienic surroundings.—*The Results of Artificial Pneumothorax and the Rôle of Other Operative Collapse Procedures in the Treatment of Phthisis, R. C. Matson, R. W. Matson, and M. Bisaillon, Tubercle, November, 1925, vii, 65 (continued).*—(*A.P.*)

Surgical Treatment of Pulmonary Tuberculosis.—Of 142 cases of pulmonary tuberculosis, 38 were treated by pneumothorax, 46 by phrenic exairesis, 42 by pneumothorax and phrenic exairesis, 2 by pneumothorax and phrenic exairesis followed by thoracoplasty, and 14 by phrenic exairesis and thoracoplasty. Only progressive cases, predominantly productive and with cavity are considered suitable, especially those with no tendency to spontaneous healing and then only when all general methods of treatment have proved unserviceable. Phrenic exairesis as a preliminary to pneumothorax is presented as a new procedure. It is believed that in such cases fewer exudates form and reëxpansion of the lung is better assured.—*Die chirurgische Behandlung der Lungentuberkulose, I. Zadek and A. Sonnenfeld, Beitr. z. Klin. d. Tuberk., 1925, lxi, 489.*—(*H. J. C.*)

Therapeutic Collapse of Lung.—A series of 19 cases treated by artificial pneumothorax is reported, and a general review is made of therapeutic lung collapse, with consideration not only of the above mentioned method, but also of phrenicotomy, apicolysis, and extrapleural thoracoplasty. Favorable results were obtained in only about 30 per cent of the 19 cases reported. This rather low figure, in comparison with 56 per cent of favorable results reported by Dumarest in 229 cases, is explained by the extreme type of case in which treatmentwas attempted. The rationale of therapeutic lung collapse is pointed out to be the prevention of the spreading of infectious matter, the prevention of absorption of toxic products, and the favoring of the formation of fibrous tissue about caseous areas. Complete collapse gives the best results, though in certain instances partial collapse, which assumes a selective aspect, is sufficient. The technique of inducing pneumothorax is reviewed. A manometer, filled with castor oil with 10 per cent chloroform, is recommended because the viscosity of this mixture presents extreme oscillations. Positive pressures should be avoided early in treatment because of the easy displacement of the mediastinal organs. Artificial pneumothorax is indicated in extensive unilateral ulcerative, caseous and fibrocaseous forms of tuberculosis, as well as in acute pneumonic and bronchopneumonic types and in severe hemoptyses. Bilaterality of lesions, and disease elsewhere, as cardiorenal disease, are contraindications. Complications are discussed, such as pleurisy with effusion, which occurs in 40 to 70 per cent of the cases,

bronchopleural fistula, empyema, and the more rare occurrences as "paradoxical" hemoptysis, and gastric or cardiac intolerance. When the pleural space becomes obliterated by adhesions, recourse must be had to extrapleural thoracoplasty, the development of which is briefly reviewed. As complements to this procedure the apicolysis of Tuffier and the phrenicotomy of Stuertz are considered.—*La collapse thérapie en rapport avec les résultats cliniques de dix-neuf cas de pneumothorax artificiel, deVloo, Rev. Belge d. l. Tuberc., May, 1925, no. 5, 135.*—(*E. H. K.*)

Treatment of Emphysema with Artificial Pneumothorax.—Five patients with pulmonary emphysema were treated with *partial* pneumothorax, with favorable results. All of the patients suffered from bronchitis. Following the induction of partial pneumothorax (300–500 cc.), expectoration at first became more profuse, but later decreased. With improvement in the bronchitis the degree of dyspnea decreased. The pneumothorax changed the type of breathing in such a way that parts of the lung previously poorly ventilated, became well ventilated. The residual air, increased in the emphysematous state, was decreased after the pneumothorax was instituted. Spasm of the bronchial musculature was lessened, and the pulmonary circulation was improved.—*Ueber die Behandlung des Emphysems mit partiellem Pneumothorax, G. Ganter, München. med. Wchnschr., February 5, 1926 lxxiii, 230.*—(*E. R. L.*)

Artificial Pneumothorax.—Recent large statistics dealing with the end-results of artificial pneumothorax in phthisis show remarkable agreement. Reference is made to the series of Rist, studied by Naveau, and those of Saugman, Brauer and Spengler and Maendl. There follows an analysis of 492 cases treated by Matson, Matson and Bisaillon. Cases still under treatment or begun in the last two years are not included. Patients are classified as "clinically well" if the sputum has been continuously negative and all signs of activity absent for two years; "arrested" if for three months. No ordinarily favorable cases were included. Of the 492, 65 had moderately advanced disease (National Tuberculosis Association) and 347 far advanced. The cases were arranged in five clinicopathological groups as follows: *1: Chronic progressive phthisis with little or no cavitation:* 194 cases, approximately one-third moderately advanced, two-thirds far advanced. A satisfactory collapse was obtained in about one-half, of whom 53 per cent are clinically well, 15 per cent arrested, 20 per cent dead. Of the partial collapse and "no free space" groups approximately 50 per cent are dead, 15 to 17 per cent clinically well, and 12 to 19 per cent arrested. *2: Chronic progressive phthisis, more advanced, with well marked cavitation:* 177 cases. Less than half (71) obtained a satisfactory collapse, of whom 40 per cent are clinically well, 32 per cent arrested, and 15 per cent dead. Of the partial collapse group, 48 per cent are dead, and of the "no free space" group 61 per cent, with but 11 and 5 per cent clinically well. The effects of the more advanced destructive nature of the disease are manifest in the end results. *3: Chronic phthisis with enormous cavitation and marked fibrosis*; 52 cases. A satisfactory collapse was obtained in 21, of whom 54 per cent are clinically well, 24 per cent arrested, and 28 per cent dead. Nearly all were chronic invalids, who had tried various climates and sanatoria without avail, and all had excessive quantities of bacillary sputum. Of 22 partial collapse cases, 13 per cent are clinically well, 9 per cent arrested and 63 per cent dead. Of 9 "no free space" cases, 22 per cent are arrested and 44 per cent dead. *4: Acute phthisis:* 39 cases. All were rapidly progressive with extensive invasion and violent symptom complex. One-third obtained a satisfactory collapse, of whom 46 per cent are clinically well, as compared with 6 per cent of those with partial collapse, while 97 per cent of 9 operative failures (no free space) are dead. *5: Cases with bilateral cavitation:* 30 in number. All were far advanced, and only 7 obtained a satisfactory collapse, of whom 3 are clinically well and 4 dead. Of the others about 60 per cent are dead, only 1 is clinically well, and 4 are arrested. *Importance of a good collapse:* of 211 such (43 per cent), 48 per cent are clinically well, 20 per cent arrested, and 21 per cent dead. Of 183 partial collapse cases (37 per cent), 13 per cent are clinically well, 13 per cent arrested, and 50 per cent dead. Of 98 "no free space" cases (20 per cent), 7 per cent are clinically well, 23 per cent arrested, and 55 per cent dead. It seems evident that in many cases a partial pneumothorax should be abandoned in favor of surgical collapse procedures. This would double the chance of recovery. Still, a partial collapse is better than none at all. *The opposite lung:* Experience has shown that the dangers of activation of disease in the other lung have been exaggerated, and that it more often improves. In 68 per cent of 211 satisfactory collapse cases there was demonstrable disease in the opposite lung, yet in less than 5 per cent was there demonstrable progression. Progression was

nearly three times more frequent in the partial-pneumothorax cases. The impression that pneumothorax should be withheld until after a thorough trial of other methods, and undertaken with much anticipation of serious complications, has slender basis. Of this series less than 2 per cent died of complications related to the pneumothorax treatment. In the satisfactory-collapse group, the commonest causes of death were intercurrent diseases and accidents, and next most common was tuberculous enteritis. One may conservatively estimate that artificial pneumothorax will restore to health 40 or 50 per cent of cases, of whom, without it, not over 7 per cent would recover. Its efficacy is principally dependent upon obtaining a satisfactory collapse.—*The Results of Artificial Pneumothorax and the Rôle of Other Operative Collapse Procedures in the Treatment of Phthisis, R. C. Matson, R. W. Matson and M. Bisaillon, Tubercle, American Section, October, 1925, vii, 12.*—(*A. P.*)

Nervous Accidents during Course of Artificial Pneumothorax.—Since the second half of the nineteenth century, a period in which pleural interventions were begun, there have been recorded accidents such as syncope, sudden death, convulsive and paralytic phenomena. Cordier, in his thesis, collected 79 of them. With the coming of the pneumothorax era and its multiplicity of punctures of the pleura which were necessary, it seemed logical to expect many more such accidents, but this does not seem to have been the case, and a review of French medical literature discloses only 9 observations prior to those here reported. *Case 1:* A woman of 35 with a left sided fibrocaseous tuberculosis and excavation of the upper lobe. Several days after the induction of a satisfactory pneumothorax a contralateral pleuritis developed, with effusion, causing intense dyspnea, and necessitating aspiration. The left pneumothorax was suspended for two weeks during this complication, and then resumed. Before the final and fatal insufflation fluoroscopy showed complete collapse of the left lung, except at the apex, where there was a dense adhesion. The needle was inserted in the anterior axillary line on a level with the nipple, near the site of previous punctures. Small oscillations were obtained, but as the impression was that of not being in the pleural cavity it was partially withdrawn, and the stilet was replaced and then reinserted. There were no oscillations. The patient complained of hearing noises in her chest, and some large tracheal râles were audible. Suddenly respiration ceased, and the patient became cyanotic, with enormously engorged jugular veins, eyes rotated and pupils dilated. There was generalized tonic contraction of the extensors, and the heart-beat and respiration ceased. A necropsy twenty-four hours later showed, on opening the thorax, adhesions at the apex of the left lung. Posteriorly, 2 or 3 cm. from the site of puncture, there was a veil-like falciform adhesion, which had been missed radiologically. The puncture wound of the parietal pleura was easily discernible and nonecchymotic, and the visceral pleura showed no trace of any wound. Section showed a massive caseous infiltration of the left lung with an apical pus-containing cavity, evidently not collapsed by the pneumothorax. The brain was not examined. *Case 2* (Dumarest and Murard): This patient had a very small pneumothorax which had been maintained ten months. At the last insufflation the pressure was raised from + 10, + 30, to prevent reëxpansion. The patient suddenly felt ill, puffed out the lips a few times, and died. No necropsy is reported. *Case 3* (Dumarest, *Bulletin Médical*, 1909, p. 127): Numerous fruitless attempts had been made to induce pneumothorax. Finally, as a last one was being made, the patient developed a glassy look, difficult respiration, and a sense of thoracic constriction, followed by paralysis of the lower extremities lasting an hour, with recovery in twenty-four hours. *Cases 4 to 10:* These exemplify the convulsive form of attack which is most frequent. Often this form is preceded by syncope, and followed by paralysis or transitory amaurosis. They may recover promptly or be followed by coma and perhaps death. *Case 4* (Dumarest, *Bulletin Médical*, January 7, 1925, p. 15) has to do with the resumption of an abandoned pneumothorax, no free pleural space being found. Nevertheless 80 cc. of gas were injected under a 25-cm. water pressure, and the injection was followed promptly by Jacksonian convulsions of the opposite side, homolateral tonic contraction of the face and neck muscles, and conjugate deviation of the eyes. After five minutes there were complete amaurosis and flaccid paralysis. The symptoms gradually disappeared, but a confused mental state persisted ten days. In *case 5* (Balvay and Arcelin. *Soc. Nationale de Médecine de Lyon*, April 25, 1911) the accident occurred at the fifth insufflation, when the introduction of the needle was painful and no manometric oscillations were obtained. There were sudden spasm, pallor, and loss of consciousness, with conjugate deviation of head and eyes, and expectoration of bloody sputum; later clonic movement of the left leg. The following day there were more

generalized convulsions at intervals; later coma, bloody expectoration and death. No necropsy was reported. *Case 6* (Lyonnet and Piéry, *Lyon Médicale*, April 23, 1911) also resulted in death. This was the second insufflation, and there was no manometric oscillation. Nothing was injected, but on withdrawing the needle the patient coughed, and this was followed by manometric movement. The reservoir flask was then raised, but immediately there were spasms of the left foot, loss of consciousness, convulsions and coma. *Case 7* (Cordier), occurring at the fourth insufflation, is not accompanied by details as to the procedure followed. In *case 8* (Cordier) the Kuss trocar appeared to be in a free space, but there was little oscillation and the patient uttered a little cry. *Case 9* (Kindberg, *Bulletin de la Société Médicale des Hôpitaux*, January 30, 1925, p. 150) occurred with a very ineffective partial pneumothorax. Before there had apparently been any passage of gas there were right facial paralysis, mydriasis, and conjugate deviation of the head and eyes; later epileptiform convulsions and sphincter paralysis. A necropsy showed no visceral or nervous lesion and no sign of gas embolism. *Case 10* (also Kindberg, *Bulletin Médicale des Hôpitaux*, January 30, 1925) was that of a very nervous patient, with an old left pneumothorax partially closed by multiple adhesions. The accident occurred at the initial puncture when the reservoir was elevated. Recovery ensued. The needle was found blocked by a blood clot. *Comment:* There are two chief explanations of these accidents: (1) gas embolism, and (2) pleural reflex. The advocates of the first view hold that the appearance of bloody expectoration is indicative of penetration of the lung, and Brauer has demonstrated air bubbles in the cerebral arteries at autopsy. On the other hand, Cordier states that the presence of bubbles in the meningeal arterioles is a common postmortem finding. Although Weber experimentally produced fatal shock by injecting minute quantities of air into the arteries of the brain, as well as convulsive and paralytic attacks, Cordier does not admit the analogy of the conditions. He is inclined to confuse gas embolism of peripheral origin with that originating in the pulmonary circulation, and proceeding by way of the left heart directly to the brain. The theory of pleural reflex, however, has been vigorously defended. Benzançon and co-workers think that in their own case gas embolism should be excluded because there was no evidence of ruptured adhesions, the pleura being intact. They consider that it has been demonstrated that peripheral excitation of the vagus nerve can arrest the heart and respiration. They also think that the psyche may play a rôle, as well as congenital vagotonia or dysneurotonia. As a prophylactic measure, they advocate peliminary injection of a mixture of morphine and camphorated oil.—*Les accidents nerveux subits au cours des insufflations du pneumothorax thérapeutique, F. Bezançon, R. Azoulay and J. Chabaud, Rev. d. l. Tuberc., August 1925, vi, 449.*—(*A. P.*)

Air Embolism in Artificial Pneumothorax.—Two cases of air embolism during refills are reported. In the one there was a typical right-sided hemiplegia with Jacksonian convulsions, which disappeared completely after ten days. In the second case there was a transient monolateral paralysis. In both cases postmortem revealed widespread pleural adhesions. The air embolism occurred without the introduction of air so that it is believed that the gas was drawn in from the closed system of tubes or from a ruptured alveolus. The use of dull needles is advocated and carbon dioxide as the gas to be preferred.—*Kasuistischer Beitrag zur Frage der Luftembolie beim künstlichen Pneumothorax, A. Freund, Beitr. z. Klin. d. Tuberk., 1925, lx, 295.*—(*H. J. C.*)

Artificial Pneumothorax in Hemoptysis.—The literature would indicate that severe hemorrhages are immediately terminated by artificial pneumothorax. Since severe hemorrhages usually come from cavities the explanation of the action of pneumothorax would seem to be the compression of the lung which reduces the danger from the hemorrhage. The relative rest of the lung in addition acts by diminishing respiratory movements. The use of pneumothorax in hemoptysis is indicated when one can determine the site of hemorrhage and when other measures are contraindicated. In the hands of the author artificial pneumothorax proved valuable in selected cases of severe hemorrhage. A large filling with gas gradually administered was utilized and at times daily refills were found necessary.—*Pneumothoraxbehandlung bei lebenbedrohen der Blutung, Ziegler, Beitr. z. Klin. d. Tuberk , 1924, lix, 381* —(*H. J. C.*)

Bacteriology of Pleural Effusions in Artificial Pneumothorax.—Tubercle bacilli are found in abundance in the fluid of pleural effusions occurring during therapeutic pneumothorax. Direct examination of a centrifugated specimen of this fluid reveals many bacilli, in contrast to the usual findings in a similar examination of the fluid from primary tuberculous pleurisy. These bacilli

often present a granular appearance.—*Recherches bactériologiques sur les épanchements pleuraux survenus au cours de pneumothorax thérapeutique, H. Durand and Charchanski, Meeting, Soc. de Biologie de Paris, June 27, 1925, reported in Presse Méd., July 4, 1925, no. 53, 893.*—(*E. H. K.*)

End-Results of Artificial Pneumothorax.—These results are based upon a series of 78 patients whose treatment commenced three to fifteen years ago. Only 5 who recovered were started after December, 1921. All were third-stage cases of pulmonary tuberculosis and sputum positive. In 9 of them pneumothorax was not originally started at Mundesley. *Results:* Of those in whom pneumothorax was feasible, 42 per cent were able to work and 50 per cent dead; of those in whom it was impossible (14) only 2 were able to work and 64 per cent were dead. The average duration of life of those who died was two and one-third years, which is considerably longer than that of a similar group untreated. It is advised to maintain the pneumothorax at least three years, and the average period in those who recovered was four years and four months. *Restoration of working capacity:* This cannot be expected in full in all cases, although, especially in young persons with sound contralateral lungs, complete recovery is possible. The expectoration of sputum containing tubercle bacilli is usually one of the first symptoms influenced. The extent of the reëxpansion of the compressed lung varies and is scarcely predictable. In rather more than one-third is there fairly complete reëxpansion. However, when much tissue destruction and excavation has occurred, any considerable reopening of the lung is undesirable.—*End-Results of Artificial Pneumothorax, S. V. Pearson, Brit. M. J., January 9, 1926, No. 3393, 52.*—(*A. P.*)

Exairesis of Phrenic Nerve in Treatment of Pulmonary Tuberculosis.—Simple phrenicotomy has been performed to paralyze the diaphragm in many cases with good results. Its effect naturally depends upon whether an accessory phrenic exists or not. Of 14 cases of phrenic exairesis, performed with thoracoplasty during the last few years, 12 were with good results. In predominantly unilateral progressive pulmonary tuberculosis, when pleural adhesions prevented artificial pneumothorax and the indications for thoracoplasty were lacking, results were obtained in 4 of 6 cases. In 2 unilateral lower-lobe cases phrenicoexairesis was followed by the disapperance of bacilli and sputum. In 3 cases of predominantly unilateral pulmonary tuberculosis with cavity the preliminary exairesis had a favorable influence on temperature, cough, expectoration and clinical findings. In 2 cases of bronchiectasis of the right lower lobe the sputum, which was 100 to 200 cc. daily, almost completely disappeared after exairesis, and symptoms improved. Permanent harm was never occasioned by the procedure, even though it may otherwise have produced no good effects. The procedure was also used in 20 bilateral cases and, as a result of these the following indications for phrenic exairesis are given: (1) in severe tuberculosis, when one side is so advanced that pneumothorax or thoracoplasty of the other is not permissible, and (2) in bilateral not too extensive tuberculosis, and also in apical tuberculosis, when the tendency to liquefaction indicates a progressive character but the process is not pneumonic. The results in the 20 bilateral cases of pulmonary tuberculosis treated by phrenicoexairesis on the most involved side showed 4 uninfluenced, 16 improved, 3 free from fever, and 5 free from expectoration.—*Kann die Phrenicusausschaltung als selbständiger Eingriff zur Behandlung der Lungentuberkulose angewandt werden? T. Landgraf, Beitr. z. Klin. d. Tuberk., 1924, lx, 81.*—(*H. J. C.*)

Permanent Results of Artificial Pneumothorax.—The literature of pneumothorax is reviewed, but little information can be obtained from this unless it is definitely known what methods are used in treatment, since most of the cases in which pneumothorax is performed are also given intensive general treatment, in the majority of cases it being associated with sanatorium residence. Excellent results are unquestionable, and this is attested especially by Saugman's statistics.—*Über Dauer- und Endresultate bei der Pneumothoraxbehandlung der chronischen Lungentuberkulose, D. Epstein, Ztschr. f. Tuberk., 1925, xliii, 463.*—(*H. J. C.*)

Severe Respiratory Distress after Thoracoplasty.—Paravertebral resection of the first to the last ribs was performed in 2 cases of pulmonary tuberculosis, resulting in severe dyspnea, which in one case disappeared in 48 hours, but in the other, in spite of all attempts to aid respiration, the patient died after 36 hours. In both cases there was some paradoxical respiration in the resected area, but it was not sufficient to explain the severe respiratory disturbances. It is believed that the deviation of the mediastinum, especially when the first rib is also removed, is the causative factor.—*Behinderung der Atmung nach extrapleuraler,*

paravertebraler Thorakoplastik, H. Hauke, Arch. f. klin. Chir., 1924, cxxxiii, 254.—(H. J. C.)

New Indications for Phrenicotomy.—Chauffard, Maurer, Retz and Hallé are quoted as employing "ventralization" of the thorax in the treatment of bronchiectasis and of gangrene of the base of the lung. The present case, in which this form of treatment was applied, was one of chronic empyema converted into pyopneumothorax after an acute flare-up. The innocuousness of the procedure is contrasted with the permanent and extensive mutilation of thoracoplasty, while it is pointed out that the immediate dangers are less. An instance is reported of the use of this procedure in curing a large eventration.—*De la phrénicectomy ou ventralization du thorax en dehors du traitement de la tuberculose, indications nouvelles, Thévenard, Meeting, Soc. de Méd. de Paris, June 12, 1925, reported in Presse Méd., July 4, 1925, no. 53, 895.—(E. H. K.)*

Exairesis of Phrenic Nerve.—Phrenic exairesis is of very limited application alone. Preliminary to thoracoplasty it is serviceable, especially in cases in which the condition of the other lung contraindicates thoracoplasty, when the phrenicotomy frequently, if given time, results in enough improvement so that the thoracoplasty can be performed with definitely less risk.—*Beitrag zur Kasuistik der Phrenicusexairese, A. Schürch, Beitr. z. Klin. d. Tuberk., 1925, lxi, 552.—(H. J. C.)*

Variations of Acessory Phrenic Nerve.—Anatomical studies were made on 17 cadavers, to determine the presence, course and anastomoses of the so-called accessory phrenic nerve. In agreement with the findings of Willie Felix the author found the union of the accessory phrenic with the main branch to occur regularly cranialward from the hilum of the lung. Three cases are, however, found in the literature in which the accessory phrenic ran caudalward to the lung root and thus contraindicated phrenic exairesis.—*Die Verlaufsvarietäten des sogenannten Nebenphrenicus, E. Ruhemann, Beitr. z. Klin. d. Tuberk., 1924, lix, 553.—(H. J. C.)*

Heliotherapy.—This article is a description, in considerable detail, of the author's methods of using sunlight in the home for the treatment of tuberculosis, pulmonary and nonpulmonary, and of those conditions in which a tuberculous toxemia is suspected but not proved to be the cause of the symptoms. The object of the treatment is to get the entire body as deeply tanned or pigmented as possible, for it is well known that patients who pigment well do better than those not tanning deeply. Sunlight treatment is indicated in practically all cases of nonpulmonary or so called surgical tuberculosis. It is not indicated in the febrile cases of pulmonary disease or when there is other evidence that the condition is active. Actual sunlight is better than artificial light. If the latter is used by means of a lamp, it should be an adjunct to exposure to actual sunlight. Heliotherapy should not be looked upon as the only means, or as the most important means, of treatment, but as an adjunct to rest, fresh air, proper nourishment and general hygiene. Signs and symptoms of too much sunlight, whether artificial or real, are the same as those of a tuberculin reaction, probably from the same cause. They are increased temperature and pulse, general malaise, headache, debility, with sometimes renewed activity in the tuberculous focus. Sunlight treatment, whenever possible, should be given under the supervision of the physician; in pulmonary cases this is absolutely essential. Sunlight treatment, in some form or another, can be carried on in the patient's home, and does not necessarily require sanatorium or hospital equipment. It should be applied methodically and if possible according to a definite schedule. Directions are given for the gradual exposure of the body to the sun.—*Heliotherapy, J. B. Hawes, 2nd, Boston M. & S. J. February 18, 1926, cxciv, 281.—(J. S. W.)*

New Instrument for Heliotherapy.—A highly polished metal reflector (kind of metal not stated) is used to concentrate and reflect sunlight. The reflected light is passed through violet-colored screens of celluloid. This is said to permit the passage of the ultraviolet rays, and thus produce a light exceedingly rich in the short waves, and yet a cold light. In the treatment of pulmonary tuberculosis this light is thrown on the bare chest of the patient for twenty minutes daily after he has gradually become accustomed to its use. In addition, general exposure to sunlight is given according to the method of Rollier.—*A new Instrument for the Use of Heliotherapy in Tuberculosis and Other Affections, J. W. Kime, Med. J. & Rec., February 3, 1926, cxxiii, 164.—(E. H. K.)*

Ultraviolet Light in Pulmonary Tuberculosis.—All forms of pulmonary tuberculosis, even in active state or with a tendency to hemoptysis, may be treated with

benefit by ultraviolet rays, provided caution is observed to avoid erythema. In cases thus treated there was noted improvement in the general condition, gain in weight and fall in temperature. There were no hemoptyses.—*Tuberculose pulmonaire et rayons ultra-violets, Ménard and Foubert, Meeting, Soc. française d'électrothérapie et de radiologie, May 26, 1925, reported in Presse Méd., June 13, 1925, no. 47, 792.—(E. H. K.)*

Ultraviolet Light for Pleural Fistula.—A case of tuberculous empyema with superimposed streptococcus infection in a child necessitated surgical drainage, with a resulting chronic fistula, which healed finally after treatment by ultraviolet rays.—*Pleurisie purulente fistulisée guérie par les rayons ultra-violets, Nobécourt and E. Picnon, Meeting, Soc. de Pédiatrie de Paris, June 16, 1925, reported in Presse Méd., July 4, 1925, no. 53, 894.—(E. H. K.)*

Ultraviolet Light Treatment in Pediatrics.—In many locations the ultraviolet rays, or the short wave-lengths in the sun's spectrum are so scanty during the winter months and on cloudy days in summer that artificial means for producing such rays have been sought. The mercury vapor-quartz lamp at present surpasses all other sources in ultraviolet efficiency, and is the best method of artificially producing rays similar to the short therapeutic rays in the sun's spectrum. Of the American mercury-quartz lamps on the market the "Burdick" and the "Victor" lamps have the same burner, the Cooper-Hewitt *Uviarc*. The quality of the rays from these burners is the same as that of the Hanovia Chemical Company's "Alpine Sun Lamp," although the intensity of the rays is greater in the Cooper-Hewitt burner. It is necessary to use a longer exposure with the Alpine lamp than the Uviarc to get the same therapeutic results. One hundred and seventy-five cases of acute rickets have been treated in the Out-patient Department of the Children's Hospital, Boston, with artificial sunlight, with universal success. Dark-skinned and negro babies require longer treatment than the fair-skinned babies. At present the moderate and severe cases of rickets are given both ultraviolet radiations and codliver oil, this combination apparently hastening the healing processes. A few patients treated for tuberculosis of the mediastinal and mesenteric nodes have responded well to ultraviolet therapy. The results in cases of tuberculous peritonitis have been variable although radiation may be a valuable asset in the treatment of this disease.—*New England Pediatric Society: Ultraviolet Therapy in Pediatrics, Boston M. and S. J. February 4, 1926, cxciv, 202.—(J. S. W.)*

Artificial Light Treatment.—Much experience of real value and of the utmost help would be acquired if those practising artificial light treatment had first a thorough training in the use of natural sun treatment. No form of artificial light quite accurately replaces sunlight. It is not to be inferred from this that artificial light treatment is not as good as sun treatment. For the production of certain effects artificial light, suitably employed, is undoubtedly preferable to sun treatment. Thus in cachectic, weakly, nonpigmenting patients much greater benefit has been obtained from small, carefully graduated exposures to suitable artificial light. When purely local light treatment is indicated, light from artificial sources is generally to be preferred, though often it may be usefully associated with general sun or light baths. It is the fashion at present to use rays of short wave-length to the exclusion of others. This tendency is wrong, and for the general light-bath sources of light most closely approximating natural sunlight are best for most purposes. With Reyn it is agreed that the carbon-arc light is the one most nearly resembling sunlight. We have here a continuous light spectrum, some of whose rays have great penetrating power.—*Observations on Artificial Light Treatment in Surgical Tuberculosis, H. Gauvain, Brit. J. Tuberc., January, 1926, xx, 1.—(J. C. D.)*

Treatment of Lupus of Nose and Upper Air Passages by Radium.—This disease affects the mucous lining of the nose, mouth, and upper air passages as much as the skin of the face and neck. By far the greater number of cases are about the age of 20, and of the lower middle class. Four definite macroscopic types are recognizable in the upper air passages: *1. Granulations:* This form is most common and typical. The granulations are often spread evenly over the surface of the mucous membrane, and may extend from the vestibule of the nose as far as, and even a little below, the larynx. They are soft and velvety in appearance and to the touch. *2. Vegetations or Proliferations:* These most commonly occur in the vestibule of the nose, and resemble a branching sessile papilloma. They may protude at the nostril, and occur in conjunction with other types of the disease. *3. Tumors:* These occur in the choanae, on the superior surface of the soft palate, and in the interarytenoid region of the larynx. *4. Ulceration:* This form is very troublesome

and is found most commonly in the mouth, on the under surface of the lip, and on the hard and soft palate. It consists of a heaped-up and thickened mucous membrane, in which are small, deep, punched-out serpiginous ulcers or pits. Of these four types of lupus the first three may be considered to be particularly favorable for treatment by radium. The last type, ulcerative, is much less readily dealt with, but can be arrested and held in check in a satisfactory manner. This less favorable reaction to treatment is most probably due to the fact that less granulation tissue is formed in this type of the disease than in the others. As regards prognosis, general opinion holds that in the great majority of cases the disease goes on for many years, and eventually leaves its victim hideously disfigured, with permanent nasal obstruction, permanent loss of voice, and sometimes even with a tracheotomy. The author's own experience is that in the majority of cases a definite disappearance of the disease can be obtained by suitable treatment; and that, if in certain small areas there is a tendency to recur, the local recurrence can again be dealt with by a repetition of the same treatment. In addition to employing all means to improve the general health of the patients the following methods are recommended: *In slight cases:* When the disease is in the neighborhood of the vestibule of the nose, or in parts of the mouth which are readily accessible, the galvanocautery is a rapid and easy method of exterminating very small patches. The burning causes replacement of the affected area by strong white scar tissue, which has, however, the effect of immobilizing the part so treated. *In severe and extensive cases:* The majority of cases, when first seen, have reached a stage which puts them in this category, and treatment by radium can confidently be recommended. This radium treatment is not new, but very few case reports have previously been published. A fresh series of cases has been closely observed for over two years, and the results have been so happy as to warrant their publication without delay. It is realized that time alone can give the ultimate scientific verdict on the questions of complete cure and possible recurrence. The fundamental success in treatment is the coöperation between the laryngologist and radiotherapeutist, ensuring the correct dosage of radium being given, and also its accurate application to the affected area. The treatment consists of short courses of four to five hours on three, four, or five consecutive days. These short courses are repeated at intervals of six weeks to two months, for a year or even longer, until the disease is eliminated. Slight cases should be treated for a few months. The tubes or plates are placed in position, with or without the application of cocaine, and kept there for the requisite time. This involves no pain and little inconvenience or discomfort. In the nose radium may be applied in the form of plates to the outer surface, and in tubes fastened at the end of a silver wire to the interior. The tubes can be pushed to any distance into the nasal fossae, which can, if necessary, be cocainized previously. In the postnasal space and on the upper surface of the soft palate it is applied by means of similar tubes passed through the nose. In the mouth application is by tubes or plates of suitable size, and the fauces and soft palate should be cocainized beforehand. The larynx is treated by external plating. The action of radium is discussed. In lethal doses it destroys living tissue and is used to destroy new growths. In stimulating doses it has the effect of accelerating the formation of fibroblasts. Its action is selective, and fibrous tissue is laid down only where the presence of the tubercle bacillus has elicited the inevitable tissue reaction. This new fibrous tissue is soft and pliable, and no undue rigidity of mobile parts, such as the larynx and soft palate, is produced. Some small patches of lupus are so faint that they cannot be seen by the naked eye, but the radium searches them out, and when the swelling takes place, which marks the reactionary stage of treatment, the presence of minute patches of the disease becomes apparent. It is probable that this treatment of lupus weakens the vitality of the tubercle bacilli, and so enables their ingestion by phagocytes to be more easily accomplished. *Macroscopic appearances of healing. 1. The reactionary stage:* This is at its height in ten to fourteen days after treatment starts. During this stage crusts come off, leaving a smooth surface. The affected area becomes swollen with edema and covered with a thin layer of sticky secretion. *2. The healing stage:* In another fortnight the same area will be seen to have shrunk below its original diseased condition, and part of it will be covered with fresh mucous membrane over a partial layer of finely striated scar tissue, which, however, is not immediately visible, but can be seen at the end of the treatment. This healing process starts at the edge of the affected area, and progresses to its centre until all the lupus has disappeared. Sometimes the disease is eliminated without any visible formation of scar tissue, a matter of considerable importance in dealing with mobile parts of the throat. The disease was eliminated and the function of the part restored in all the laryngeal cases treated.

In the nose the results were equally satisfactory if less dramatic. The swelling and crusting completely subsided, leaving a free airway and often a healthy secreting surface. The soft palate and fauces, although occasionally scarred, were left in a freely mobile condition. In one case, in which there was more scarring than usual, massage was applied to the part under local cocaine anesthesia, and free motility was restored. In contrast to the treatment adopted in tuberculosis of the larynx, for which complete rest for the throat is enjoined, the patient suffering from lupus should be encouraged to use the voice as much as possible while under treatment with radium, so as to regain whatever suppleness is possible in the scarred muscular tissue and mucous membrane. A brief account of the technical aspect of radium therapy is given, also an appendix of cases recently treated.—*Lupus of the Nose and Upper Air Passages Treated by Radium, H. M. Wharry and O. Teichman, Lancet, December 19, 1925, ccix, 1275.—(J. C. D.)*

X-Ray Treatment of Pulmonary Tuberculosis.—The technique advocated by Lorey in 1912 has been markedly modified by Bacmeister, with special emphasis on careful individualization of the procedure. There was a gradual increase of the dosage from series to series, with careful observation of the reaction and tolerance. Serious harm under careful treatment and clinical observation did not occur. Improvement occurred in acino-nodose, nodo-fibrous, and cavernous cirrhotic forms. Some cases of this type, however, progressed unfavorably. It is believed that roentgen deep therapy, in suitable cases of pulmonary tuberculosis, brings about healing, especially when combined with specific subcutaneous therapy. Specifically treated cases making very slow progress were especially benefited by roentgen treatment and brought to latency.—*Die Röntgenbehandlung der Lungentuberkulose, A. Lorey and A. Gehrcke, Beitr. z. Klin. d. Tuberk., 1925, lxi, 378.—(H. J. C.)*

X-Ray Treatment of Pulmonary and Laryngeal Tuberculosis.—The productive cirrhotic forms of pulmonary tuberculosis are best suited for roentgen treatment. The disease, however, presents, as a rule, mixed forms; for example, besides nodular productive, cirrhotic foci there are more or less outspoken exudative processes present. Of these those are selected in which physical and radiological findings, as well as the clinical course, indicate a high resistance to the disease and a good reaction power, as shown by the temperature, behavior of the blood, sedimentation rate of the erythrocytes, Matefy reaction, and function of the heart, vessels and kidneys. In addition to these cases, there are suitable for X-ray treatment cases of artificial pneumothorax with incomplete collapse of the lungs and widespread pleural adhesions, in which phrenic exairesis has brought about limited rest of the diseased lung. Treatment is also suitable in productive forms of laryngeal tuberculosis, while extensive ulcerations and inflammation of the perichondrium with disease of the cartilage are to be excluded from treatment. Operative measures and X-ray treatment of the larynx should be separated by wide intervals of time. A combination of sun therapy and increasing the reactivity of the skin is recommended. Carefully applied roentgen treatment is a valuable adjunct in the sense of favoring fibrosis in the lung and larynx. A critical review of the case before applying treatment is essential.—*Über die Röntgenbehandlung der Lungen- und Kehlkopftuberkulose, G. Schröder and H. Deist, Beitr. z. Klin. d. Tuberk., 1925, lxi, 384.—(H. J. C.)*

Treatment of Pulmonary Tuberculosis with Krysolgan.—Seventy cases of various types and stages of pulmonary tuberculosis that coincidently took the fresh-air cure at home, are reported upon. Small initial doses were increased until 0.05 gm. was reached at intervals of 10, 15 and 20 days. The final larger dose was then given at monthly intervals. In this way the reactive power of the body for krysolgan was retained. Ectebin inunctions were used at the same time, to prevent exhaustion of the reaction power of the body, so that reactions still occurred with small doses of krysolgan. Except for a few individual cases the 1,000 injections given produced no harm, and in spite of marked focal reactions there was never noted a progression of the disease. In extensive exudative processes no appreciable result of treatment was determinable, but in the remaining cases a healing action of the krysolgan was found to occur. Of the 70 treated cases, 30 to 35 per cent showed improvement, which was not possible with general treatment alone. A general or focal reaction does not seem necessary to obtain a beneficial effect. In open cases freedom from bacilli in the sputum was only exceptionally attained.—*Beiträge zur Krysolganbehandlung der Lungentuberkulose, A. Schneider, Ztschr. f. Tuberk., 1925, xliii, 136.—(H. J. C.)*

Treatment of Tuberculosis with Krysolgan.—Krysolgan is a helpful medium in early tuberculosis, but is of no value without

other treatment or in late stages of the disease. Claims for phenomenally good results have not as a rule been well controlled.—*Krysolgan bei Tuberkulose, G. Schellenberg, Deutsche med. Wchnschr., July 3, 1925, li, 1116.*—(*H. S. W.*)

Sanocrysin.—Attempts to use salts of the heavy metals in tuberculosis are not new. A. Luton in 1885 and E. Luton in 1895 determined that injections of copper salts in tuberculous patients produced a general reaction with fever, in some instances similar to a tuberculin reaction. About this time treatment with the double cyanide of potassium and gold was advanced by Koch but abandoned since it gave unsatisfactory results. During the past eight years favorable results have been reported from Germany by the use of Krysolgan, a double salt of sodium derived from an organic complex, in which an atom of gold is fixed on a benzene nucleus. It remained for Moellgaard to announce that the double thiosulphate of gold and sodium, *Sanocrysin*, possessed the properties, which, as indicated by Ehrlich, an antituberculous medication should have, namely, solubility and rapid diffusibility in water, and slow decomposition in the body without forming toxic substances. The experimental work of Moellgaard is reviewed, including the development by injecting defatted bacilli into animals of an antiserum to combat Sanocrysin shock, believed to be caused by liberation of toxins from the bacilli killed by the drug. Following experiments with animals, from which it was concluded that sanocrysin could prevent death and bring about an arrest of the disease in those infected with tuberculosis, the drug was tried on human beings. From personal observation in Denmark the technique of administration, the types of reactions, the indications, contraindications and results, are reviewed. A 5 per cent solution is used intravenously, though a 3 per cent solution may be used intramuscularly. It has been found that small initial doses of 0.05 to 0.1 gm., gradually increased by 0.1 to 0.15 gm. at each injection, until a dose of 0.8 to 1 gm. is reached, are less likely to produce severe reactions. The minimum interval between doses is four or five days, rather than two or three as was the case originally. This procedure permits recovery from any reaction to the previous injection, and reduces the number of cases of shock. Treatment is discontinued when there is no longer any febrile reaction, which is generally after 8 or 9 treatments (8 to 10 gm. of the drug). Maximum reaction is obtained after the second and third treatments, after which it gradually becomes less. To observe reactions, careful temperature and pulse records must be kept with the patient in bed, and daily urine examinations must be made. General reaction is manifested by fever and loss of weight. Sanocrysin shock generally begins with a sudden fall in temperature, albuminuria, irregular pulse, and accelerated respiration and is combated by the intravenous administration of 20 to 30 cc. of antiserum. As dosage has been more carefully graduated and spaced, this occurrence has become less frequent. When treatment is finished, weight is promptly regained. Renal reaction, as manifested by albumin and casts in the urine without chloride or urea retention in the blood, are not benefited by the antiserum, but tend to disappear spontaneously after a few days to a week or more. Treatment must be discontinued while albuminuria persists. Gastrointestinal reactions may occur, such as stomatitis, and enterocolitis, with diarrhea and occasionally hemorrhage. Pseudoexanthematous manifestations, disappearing in a few days, are frequent. In acute tuberculosis, physical signs and cough and expectoration may be increased, indicating a focal reaction. Treatment is contraindicated in patients with renal insufficiency with albuminuria, those with intestinal disease, and those with poor resistance. As evidenced by diminution of physical signs, lessening of cough and expectoration, and disappearance of bacilli from the sputum, the majority of those examined appear to have been benefited. Radiographic examination confirmed the beneficial effects of treatment. The exudative type of disease appears to respond more readily than the productive type, in which the predominance of fibrous tissue possibly interferes with the permeability of the vascular wall. It is generally agreed that the treatment is especially efficacious in the young and in those who have not had active disease for more than six months or a year.—*Traitement cliniothérapique de la tuberculose pulmonaire, G. Poix, Presse Méd., June 3, 1925, no. 44, 729.*—(*E. H. K.*)

Treatment of Pulmonary Tuberculosis with Sanocrysin.—Sanocrysin was administered to 18 patients with pulmonary tuberculosis, 12 of them with the exudative type, 2 with pure productive tuberculosis, and 4 with mixed exudative and productive disease. Administration was by slow intravenous injection, the first dose being 0.5 gm., and subsequent doses 1.0 gm. in warm distilled water. The serum recommended by Moellgaard was not used. All patients were kept in bed. Of the 18 patients 4 died in the

course of treatment, 8 remained unchanged, and 6 improved. Tuberculous meningitis in the fatal cases was not influenced in any way. On the other hand, no harm resulted from its use in these cases. Reactions with fever and skin and mucous membrane changes regularly occurred, and seemed to bear no relation to the type of case. Individual factors, such as the general condition, the presence of fever, individual tolerance for gold salts and particularly the condition of the eliminative organs, were of much more importance. The reaction was thus not to be looked upon as tuberculo-toxic in character, but as a direct gold effect. Sanocrysin was injected into three patients with inoperable carcinoma and no recognizable tuberculosis. In 2 of these the absence of tuberculosis was later proved at autopsy. All 3 patients showed the usual reactions observed on administration of the compound to tuberculosis patients, including fever, light exanthem and albuminuria. Albuminuria was transient, but occurred with each injection. Four patients with lobular pneumonia were treated with sanocrysin, in order that the effect of the gold salt on a febrile exudative process of another sort might be studied. The first injection was 1.0 gm. and subsequent injections reached 3.0 gms. In one patient chills with high fever occurred on the administration. Albuminuria occurred in every case. The course of the pneumonia was not influenced. Later observation of these patients ruled out the existence of tuberculosis. People with positive tuberculin reactions, but no signs of active tuberculosis, on injection showed symptoms of intoxication, including chills, fever, diarrhea, albuminuria, conjunctivitis, rhinitis and exanthem. No focal reaction was caused, nor any other manifestation suggesting the lighting up of an old tuberculous process. The symptoms which follow the injection of sanocrysin are thus not dependent upon the presence of tubercle in the patient, but upon the toxic action of the gold itself. The action of sanocrysin is thus not specific.—*Ueber die Wirkung des Sanocrysins, E. LeBlanc, München. med. Wchnschr., February 19, 1926, lxxiii, 313.*—(*E. R. L.*)

Treatment of Tuberculosis with Sanocrysin.—When first introduced, sanocrysin was supposed to have a powerful bactericidal effect upon the tubercle bacillus. But later workers explain the reaction that follows the administration of the drug in an altogether different manner; namely, that it acts as tuberculin does upon the focus, and they advocate the use of the drug in small quantities. This will not only prevent the frightful symptoms of the reaction, but also prevents metal poisoning. In three severe cases of tuberculosis, the use of sanocrysin in the large doses advocated by Moellgaard produced very severe reactions, and the administration of the serum not only did not help but seemed to aggravate the already wretched condition of the patients. In the further use of sanocrysin in small doses and without the serum (on 42 cases), the patients did decidedly better, although some of them reacted markedly to the same dose that had a few days previously produced no reaction. If the smaller doses can be tolerated without severe reaction, the dosage may be begun at 0.1 gm. and very gradually increased. Larger doses are distinctly dangerous. No criteria can be given as to what type of case is likely to do well or badly. Although, when the reactions are mild, the drug seems to do some good, the results as well as the nature of the reaction seem to be no different from those following the administration of krysolgan, triphal or tuberculin.—*Sanocrysinbehandlung bei Lungentuberkulose, F. Klemperer, Deutsche med. Wchnschr., January 29, 1926, lii, 186.*—(*H. S. W.*)

Treatment of Tuberculosis with Sanocrysin.—From the treatment of 54 cases of tuberculosis with sanocrysin, it would appear that the more acute the disease the more responsive is the patient to the drug. The maximum dose for males was 1.0 gm. and for females 0.5 gm. Larger doses than this produced very bad reactions at times. The Permin method, consisting of small doses, the maximum never greater than 1.0 gm. and the interval between doses never less than eight days, was used in 35 cases, and gave more satisfactory results than other methods. Fever was the best guide in the treatment. In several cases with fever in which the latter diminished or disappeared as a result of the treatment, improvement generally appeared promptly with diminution in constitutional symptoms, increase in weight, disappearance of tubercle bacilli from the sputum (in 7 cases), diminution in râles, and clearing of exudative processes as shown by X-ray. Altogether 19 of the 54 cases showed improvement, and this is noteworthy since many of the patients were well along in their disease. Of the improved cases, 63 per cent were of the exudative type: of the unimproved, only 40 per cent fell into this class. The most favorable results occurred, therefore, in the acute, exudative cases. The improvement in these cases justifies the use of the drug as a forerunner of such surgical procedures as pneumothorax or thoracoplasty, as by this means numerous small

foci of new fresh exudative disease could be brought to a nonprogressive stage. The drug, although it definitely helps in acute tuberculosis, cannot be regarded as a curative medium.—*Behandlungsergebnisse mit Sanocrysin bei Tuberkulose, U. Friedmann, S. Kinasniewski and H. Deicher, Deutsche med. Wchnschr., January 22, 1926, lii, 138.—(H. S. W.)*

Treatment of Tuberculosis with Sanocrysin.—Ten cases of pulmonary tuberculosis, mostly of severe type were treated with sanocrysin, with satisfactory results. Vomiting, collapse, shortness of breath, and increase in pulse-rate could not be prevented. The size of dose exerted no influence upon the appearance or absence of these reactions. Increase in temperature, skin eruptions, albumin in the urine and shock occurred. Pain and swelling of the joints occurred three times, a morbiliform exanthem twice, and albuminuria three times. Sanocrysin should be given only when the kidneys function normally. The focal reaction was not believed to be of any significance, since this can also be elicited by nonspecific reagents. In none of the cases was an aggravation of the disease noticed after the administration of the drug.—*Über die Sanocrysinbehandlung der Tuberkulose nach Mollgaard, F. Koch, Centralbl. f. innere Med., 1925, xlvi, 861.—(H. J. C.)*

Treatment of Pulmonary Tuberculosis with Sanocrysin.—Twenty patients were treated with sanocrysin. In 12 of these the exudative, and in 4 the productive form predominated. The others included ulcerative tuberculosis, lymphatic tuberculosis and tuberculous polyserositis. Eleven were treated with large doses (above 0.5 gm.) and 9 with small doses. Four, or 20 per cent, were definitely improved; 7, or 35 per cent, were favorably influenced; 5, or 25 per cent, remained unchanged; 2, or 10 per cent, were made worse; and 2, or 10 per cent, died. Of the 11 patients showing improvement 5 were at the same time under pneumothorax treatment. Sanocrysin appeared to Jessen to have no bactericidal action, but simply a toxic metallic effect. No action whatsoever could be attributed to the Moellgaard serum. The conclusions were that sanocrysin is not a cure for tuberculosis and the Moellgaard serum is valueless; the gold salt, because of its predominantly metallic action, is a dangerous poison capable of setting up reactions not necessarily proportional to the dosage used, and quite unsuitable for general ambulant practice; sanocrysin may be useful in purely productive tuberculosis.—*Zur Sanocrysinbehandlung der Lungentuberkulose, H. Jessen, München. med. Wchnschr., March 12, 1926, lxxiii, 444.—(E. R. L.)*

Treatment of Tuberculosis in Children with Sanocrysin.—The use of sanocrysin in the treatment of tuberculosis in children meets with unfavorable results, at least when the present methods of administration are employed. It is better to wait until some modifications have been devised. The drug was used, however, in 12 cases, in which the outlook was very grave and in which its use could do no harm. There were 3 cases of miliary tuberculosis, 3 of tuberculous meningitis, and 6 of extensive bilateral pulmonary tuberculosis. Of these 12 children, 11 died and the condition of the other is grave. The treatment probably shortened the course of the pulmonary cases, but had no demonstrable effect upon the other cases. The doses were those advocated by Moellgaard, that is, 0.01 gm. per kilo of body weight, and were given intravenously, but no severe reactions were apparent. Albuminuria was a frequent concomitant, and occurred sometimes as early as four hours after the injection, and lasted from one-half day to three weeks. Little or no influence was noted on the pulmonary condition and on the presence of bacilli in the sputum. The serum was used in several cases without any demonstrable result, good or bad. At autopsy the kidneys were congested and had some cloudy swelling and fatty changes: no significant changes appeared in the lungs that could be attributed to the drug. Sanocrysin may have a place in the treatment of tuberculosis, but, until other modes of application are brought forth, its use must be limited.—*Sanocrysinerfahrungen in der Universitätskinderklinik in Berlin, Czerny and Opitz, Deutsche med. Wchnschr., January 22, 1926, lii, 136.—(H. S. W.)*

Effect of Moellgaard's Serum in Tuberculous Animals.—In order to test the efficacy of the Moellgaard serum, guinea pigs were infected with tubercle bacilli and then were treated as follows: After allergy had been established in the animals, each was given an intraperitoneal dose of Old Tuberculin consisting of 0.1 gm. for every 250 gm. of body weight. Some were kept as controls, and the remainder were divided into groups, one of which received an injection of 1 cc. of normal cattle serum at the time of injection of tuberculin. These had also had a similar injection the previous day. Another group received two similar injections of the Moellgaard serum, and a third received, at the same time with the others, the same dosage of Uhlenhuth's

Bovinol. After the tuberculin injections, the animals in the different groups went into shock, and died or survived indifferently. The Moellgaard serum exerted no beneficial effect on the animals receiving it. Whether the symptoms that follow the administration of sanocrysin depend upon a tuberculin-like phenomenon or upon the ill effects of the metal is still an open question.—*Besitzt das Möllgaardsche Tuberkuloseserum spezifisch entgiftende Wirkungen? Opitz and Kotzulla, Deutsche med. Wchnschr., March 26, 1926, lii, 531.*—(*H. S. W.*)

Treatment of Night-Sweats with Salvysat.—There are always valid objections or disagreeable features in regard to the use of the standard drugs ordinarily employed for night-sweats in tuberculosis. A new preparation called *Salvysat* has been used with considerable success. It is made by dialysis of the fresh leaves of the folk remedy *Folia salviae* and contains 0.014 to 0.023 gm. of oil of salviae per cubic centimetre. Forty-seven patients suffering from pulmonary tuberculosis, and having obstinate night-sweats that were refractory to ordinary treatment, were treated with the drug. It was given in doses of 15 to 30 minims three times a day. Sweats were well controlled, and in 32 cases were completely stopped, the results appearing on the third or fourth day. The sweats usually return upon discontinuance of the drug, and the drug may be administered indefinitely with only an occasional short intermission. In only 5 of the 47 cases was the response not highly efficacious, and these were patients almost *in extremis*. A new preparation of camphor in colloidal suspension in glycerine and gelatine, known as *Camphorgelatinette*, has been recently put on the market, and was used on 17 patients with night-sweats with about the same results as those from the use of Salvysat.—*Zur Behandlung der Nochschweisse Tuberkuloser, Zwerg, Deutsche med. Wchnschr., October 16, 1925, li, 1742.*—(*H. S. W.*)

Silicic Acid Therapy.—Silicic acid has a fibroplastic and leucocytactic action. A therapeutically active silicic acid is only to be derived from plants, because they are able to transform insoluble mineral silicic earths into soluble silicic acid. The use of silicic acid-containing teas is to be criticized from the standpoint of their variable silicic-acid content, as well as the presence of harmful residual substances and too large amounts of water which may be detrimental to the stomach, heart and kidneys. Silicic-acid mineral wells are frequently too high in silica content, but silicic-acid preparations from purely chemical sources, especially when injected, as well as those introduced parenterally, are much better. *Mutosan* is recommended, since it contains, besides silicic acid, chlorophyll which acts as a stimulant to blood formation and hemoglobin.—*Beitrag zur Geschichte der Kieselsäuretherapie, G. Zickgraf, Centralbl. f. Innere Med., 1925, xlvi, 930.*—(*H. J. C.*)

Effect of Metallic Salts on Experimental Tuberculosis.—Mice infected with tubercle bacilli, and subsequently inoculated with a great variety of metal salts, died of tuberculous intoxication, but not of tuberculous infection. The metal salts appeared to liberate endotoxins from the bacilli at a rate too rapid for the mice to overcome. The action of metal salts on tuberculous guinea pigs varied greatly with the salt. Aluminum and manganese exerted a favorable action. Gold acted less favorably. Caesium had the least activity of all. The concentrations of metal salts which had a favorable therapeutic effect on tuberculous guinea pigs coincided with the optimum concentrations for the promotion of antibody production in general. These concentrations were definitely lower than those necessary to stimulate the growth of bacteria.—*Metallsalztherapie, L. E. Walbum, Ztschr. f. Immunitätsforsch. u. exper. Therap., August 1, 1925, xliii, 433.*—(*E. R. L.*)

Stovarsol for Tuberculosis Verrucosa Cutis.—A case of verrucous skin tuberculosis of the back of the right hand, occurring in a bilateral open case of pulmonary tuberculosis in a patient 30 years of age, was given 0.75 gm. *Stovarsol* (Acetyl-amino-oxyphenylarsinic acid) at 3-day intervals; a total of 20 gm. was given in seven weeks. The skin affection gradually disappeared, and the general condition and weight of the patient improved.—*Ein Fall von Tuberculosis cutis verrucosa, günstig beeinflusst durch interne Stovarsoltherapie, K. Heymann, Ztschr. f. Tuberk., 1925, xlii, 490.*—(*H. J. C.*)

Vaginal Hysterectomy under Local Anesthesia in Pulmonary Tuberculosis.—In pulmonary tuberculosis, when interruption of pregnancy and sterilization become necessary, the total vaginal hysterectomy under local anesthesia, leaving behind the adnexa, is considered advisable. Local anesthesia, using 0.5 per cent novocaine-suprarenal solution, possesses advantages over narcosis and lumbar anesthesia.—*Die vaginale Totalexstirpation der graviden Uterus in Lokalanästhesie bei Lungentuberkulose, R. Hornung, Centralbl. f. Gynaek., 1925, xlix, 1250.*—(*H. J. C.*)

Alcoholic Nerve Injections for Relief of Laryngeal and Pleuritic Pain.—Ranson has shown that a sensory peripheral nerve contains both medullated and nonmedullated fibres, and that the latter carry the protopathic or pain-producing impulses. These axones take origin from the small cells in the dorsal root ganglia. The introduction of alcohol into a peripheral nerve produces an axonal degeneration involving mostly these small cells. A 60 per cent solution of alcohol will produce quite extensive degeneration of the afferent fibres and ganglia while producing only slight transitory motor weakness. *Laryngeal pain in pulmonary tuberculosis:* The pain in laryngeal tuberculosis may be so severe as to interfere with both rest and alimentation. Insufflations, inhalations and local injections have all been tried without success. Operative interference, including curettage and cauterization, has always ended disastrously and usually shortens life. Surgical exposure and injection or crushing of the superior laryngeal nerve have yielded good results in a limited number of cases (Steinmann, Teller). In 1908 Hoffmann suggested injecting alcohol into the nerve and his method was taken up by others. Lukens has reported relief in 19 cases for periods varying from three to forty-one days. *Anatomy:* The superior laryngeal nerve arises from the lower ganglion of the vagus, and runs downward and inward toward the superior horn of the thyroid cartilage. About 1 cm. in front of, and a little below the cornu of the hyoid, the nerve divides into external and internal branches. The former supplies the subglottic portion of the larynx and ventricle, the latter the base of the tongue, epiglottis and larynx. The ganglion of the trunk is in connection with the upper ganglion of the vagus, which gives off an auricular branch which courses along the inner surface of the facial canal to supply the posterior part of the auricle and posterior inferior portion of the external auditory canal. *Technique:* The patient is placed in the dorsal recumbent position with a rolled sheet beneath the shoulders. The great cornu of the hyoid is brought into prominence by pressure on the opposite side with the left forefinger. A 5 cm. unattached needle is inserted about 2 cm. median to and 1 cm. below the great horn of the hyoid. It is directed backward and slightly upward toward the great horn. Its point must not pass laterally beyond a line joining the greater cornua of the thyroid and hyoid. It is pushed in for about 1.5 cm., to lodge between the thyrohyoid muscle and membrane. When the nerve is struck the patient experiences sharp pain in the ear of that side, which he indicates by raising his hand. Then a syringe is attached to the needle, and a solution of 60 per cent alcohol (warm) containing 1 per cent cocain hydrochloride is injected. The subjectively most painful side is injected, determined by careful preliminary palpation. A frequent cause of failure is the injection of alcohol into the fascia instead of the nerve. The thyrohyoid area must be lightly probed in order to locate it. Of 13 patients treated 8 were completely relieved and there was one complete failure. The relief in one case has lasted ninety-six days. Some immediate motor difficulty in swallowing must be anticipated, also temporarily increased local pain, lasting at most two days. *Pleuritic pain in pulmonary tuberculosis:* An apparently new method of application of alcoholic injections into nerve tissue to control the severe thoracic pain of chronic pleuritic involvement is described, and five cases reported. The upper six intercostal nerves supply the upper parietal costal pleura. The lower six supply the lower parietal costal pleura and the diaphragmatic parietal pleura, the centre of the diaphragm being supplied by sensory fibres of the phrenic which pass to the cervical plexus. Irritation of these fibres causes referred pain in the neck over an area supplied by the third, fourth and possibly fifth cervical nerves. Rather than to attempt injection of the intercostal nerves in their thoracic course it was decided to approach the dorsal root ganglia or fibres in the intervertebral spaces. Upon emergence from the intervertebral foramina these fibres lie midway between the transverse processes of the two adjacent vertebrae, and run obliquely toward the angles of the ribs above, to enter the subcostal grooves. They lie upon thin aponeuroses termed the internal intercostal fasciae, which extend to the tubercles of the ribs and are immediately external to the pleura. *Technique:* The intercostal nerves injected are those whose skin areas are hyperalgesic to pin prick. The patient is placed on the side opposite that to be injected. The knees and hips are flexed on the abdomen, and the head approximated to the lower extremities. A line is drawn through the midline of the vertebral spines on the skin. At a point 4 cm. from this line and over the ribs which are above the spaces to be injected, wheals of 2 per cent novocaine are raised. An 8-cm. needle is inserted through each wheal, and directed perpendicularly to the posterior surface of the rib above. As soon as it impinges on the rib it is slightly withdrawn, and so directed that its shaft points 45 degrees downward, inward and forward toward the lower rib border. It is then advanced 2 cm. further, when the point should lie between the internal and external

intercostal muscles. The needles are then attached to a water manometer to determine whether they are in the pleural space. If not, 2 to 3 cc. of novocaine are introduced through each, and the skin areas are again tested. If the hyperalgesia disappears or diminishes within a few minutes, 2 to 3 cc. of warm 80 per cent alcohol are injected. This produces an axonal degeneration of the nerves near the ganglion cells. Following the injection there is usually an increase of pain for a day or two and then a gradual diminution or disappearance. *Injections for other types of pain:* The great occipital and supraorbital nerves have been injected for headaches, the dorsal root fibres paravertebrally for angina and the painful crises of tabes, and the epidural space with 20 per cent alcohol in saline solution for pruritus ani with very marked results.—*Alcoholic Injections into Nerve Tissues for the Relief of Pain, G. I. Swetlow, Am. J. M. Sc., March, 1926, clxxi, 397.*—(*A. P.*)

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INDEX OF ABSTRACTS OF TUBERCULOSIS

Abdominal lymph nodes, Tuberculosis of, 81
Abscess, cold, following Albee operation, Paraplegia from, 143
——, lung, Treatment of, 41
—— of lung, 30
Abscesses, tuberculous, Treatment of, 135
Absorption and elimination of volatile substances, 97
Accessory phrenic nerve, Variations of, 156
Accidents during course of artificial pneumothorax, Nervous, 153
—— of artificial pneumothorax, Some rare, 13
Accurate study of tuberculosis desirable, More, 62
Acid-fast bacilli, growth of, Carbon dioxide and, 104
—— ——, Intrauterine inoculation of, 103
—— saprophytes, antigens from, Complement fixation in tuberculosis with, 105
—— ——, Cultivation of tubercle bacilli and, from sputum, 124
Active principles of tuberculin, 110
Activity, guide of, Matefy reaction as, 134
—— in pulmonary tuberculosis, Diagnosis of, 121
Acquired resistance to tuberculosis, Cancer and, 50
Actinomycosis of pleura, 31
Acute consolidation of lung, 29
—— disseminated bronchopneumonia simulating acute miliary tuberculosis, 40
—— miliary tuberculosis, Acute disseminated bronchopneumonia simulating, 40
—— respiratory disease, Metastatic tumors of lung simulating, 50
Adequate diet for cattle, Tuberculosis and, 85
Adjuvant in treatment of tuberculosis, Methylic antigen as, 147
Adrenals in treatment of tuberculosis, Emulsions of testes and, 26
Adult, Tuberculin skin reactions in, 126
——, tuberculosis in, Secondary stage of, 88
Age, play, children of, Tuberculin reactions in, 78
——, school, tuberculous infection at, Frequency of, 77
Aged, Tuberculosis of, 62
Aid to artificial pneumothorax, Injection of exudate as, 149
Air embolism, Fatal, in artificial pneumothorax, 14
—— —— in artificial pneumothorax, 154
—— passages in artificial pneumothorax, Patency and permeability of, 5
—— ——, upper, lupus of nose and, Treatment of, by radium, 157
Albee operation, Paraplegia from cold abscess following, 143
Alcoholic nerve injections for relief of laryngeal and pleuritic pain, 164
Alkalysol, Disinfection of tuberculous sputum with parmetol and, 58
Allergic states, Leucocytes in, 101
Allergy, Inflammation due to, 111
——, vegetative, Blood and, 102
——, ——, in tuberculosis, 111
Alternating or substituted infections masking pulmonary tuberculosis, 124
Altitudes, high, Leucocytes in pulmonary tuberculosis at, 100
Alveolar pores of pneumonia, 29
Alwens, W. Etiology and treatment of chronic bone tuberculosis, 141
Ambard constant in tuberculosis, Value of, 130
Ambulant tuberculosis in children, Epidemiology of, 77
—— —— —— ——, Types of, 81
Anaerobic growth of tubercle bacilli, 106
Anatomic reactions to fractions of tubercle bacilli, 91
Anatomical predisposition to apical tuberculosis, 69
Anatomy and genesis of tuberculosis in infants, 76

Andebert and Baylac. Artificial pneumothorax and "ventralization" in pregnancy complicated by pulmonary tuberculosis, 14
Anesthesia, local, Vaginal hysterectomy under, in pulmonary tuberculosis, 163
Animals, tuberculous, Effect of Moellgaard's serum in, 162
Ankylosis of spine in pulmonary tuberculosis, 142
Anthraco-chalicosis of bronchial lymph nodes and bronchitis deformans, 46
Anthracotic tuberculous infiltrations of apex, 89
"Antibodies," artificial, Treatment of tuberculosis with, 26
——, Fat and lipoid, in tuberculosis, 113
—— to sheep blood in tuberculosis, 113
——, Tuberculosis, and skin reaction during artificial pneumothorax, 11
Antigen, Boquet-Nègre, Treatment of pulmonary tuberculosis with, 148
——, Dreyer's, in experimental tuberculosis, 24
——, —— tubercle, and experimental tuberculosis, 23
——, Methylic, as adjuvant in treatment of tuberculosis, 147
Antigenic substances of bacterial cells, 108
Antigens from acid-fast saprophytes, Complement fixation in tuberculosis with, 105
Antituberculosis measures, 66
—— work in Porto Rico, 66
Aoyama, K., Ohnawa, J., and Arima, R. New defatted tubercle bacillus for immunization, 57
Apex, Anthracotic tuberculous infiltrations of, 89
Apical nontuberculous pneumonia, Subacute, 40
—— pulmonary tuberculosis, right-sided, Cause of preponderance of, 89
—— tuberculosis, Anatomical predisposition to, 69
Apices of lungs, Percussion of, 122
——, pulmonary, Cartilaginous pleural callosities at, 89
——, X-ray examination of, Technique of, 123
Appraisal of artificial pneumothorax, 3
Arima, R., Aoyama, K., and Ohnawa, J. New defatted strain of tubercle bacillus for immunization, 57
Arloing, F., and Dufourt, A. Polymorphism of tubercle bacillus, 107
——, ——., —— Malaitre. Sections through cultures on potato media, 107
Armand-Delille, P. Artificial pneumothorax in children, 82
——, ——., Lévy, R., and Marie, J. Artificial pneumothorax in pulmonary tuberculosis in childhood, 4
Arnold and Prenzel. Tuberculosis in children, 76
Arsphenamine, Treatment of spirochetal pulmonary gangrene with, 19
Artificial "antibodies," Treatment of tuberculosis with, 26
—— light treatment, 157
Artificial pneumothorax, 152
—— ——, accidents of, Some rare, 13
—— ——, aid to, Injection of exudate as, 149
—— ——, Air embolism in, 154
—— ——, —— passages in, Patency and permeability of, 5
—— —— and "ventralization" in pregnancy complicated by pulmonary tuberculosis, 14
—— ——, Appraisal of, 3
—— ——, double, Successful, 4
—— ——, effusions in, Prevention of, 13
—— ——, —— ——, Treatment of, 13
—— ——, End-results of, 155
—— ——, Evolution of tuberculosis in lungs collapsed by, 4
—— ——, Fatal air embolism in, 14
—— ——, Fibrosing pleurisy in, 14
—— ——, Fluoroscopy in, 11
—— —— in children, 82
—— —— —— hemoptysis, 154
—— —— —— pulmonary tuberculosis, 3
—— —— —— —— —— in childhood, 4
—— ——, Indications and contraindications of, in pulmonary tuberculosis, 2
—— ——, Nervous accidents during course of, 153
—— ——, Permanent results of, 155
—— ——, pleural effusions in, Bacteriology of, 154

Artificial pneumothorax, pleural pressures in, Determination of, 9
—— ——, Pleurisy in, 12, 13
—— ——, Pressures in, 8
—— ——, skiagrams in, Simple method of obtaining, 10
—— ——, Sudden death following pleural puncture in, 14
—— ——, Thoracic and intrapleural respiratory tracings in, 9
—— ——, Tuberculosis antibodies and skin reaction during, 11
—— ——, Vital capacity in, 6
Aspirated foreign body nine years in lung, 45
Atkinson, D. W. Nontuberculous pulmonary fibrosis, 31
Aumont and Block. Intensive serotherapy in pulmonary gangrene, 38
Austin, R. S. Tissue extracts in tuberculosis, 102
Autopyotherapy in tuberculosis, 148
Avian tuberculosis in man, 70
Azoulay, R., Chabaud, J., and Bezançon, F. Nervous accidents during course of artificial pneumothorax, 153

Bacilli, acid-fast, growth of, Carbon dioxide and, 104
—, ——, Intrauterine inoculation of, 103
Bacilli, tubercle, and acid-fast saprophytes, Cultivation of, from sputum, 124
—, ——, Bacteriolysis of, 107
—, ——, Cellular reaction to, 91
—, ——, dead, Immunization of infants with 57
—, ——, ——, —— with, 56
—, ——, Demonstration of, in suspected material, 123
—, ——, fractions of, Anatomic reactions to, 91
—, ——, growth of, Anaerobic, 106
—, ——, —— ——, Influence of light on, 107
—, ——, human and bovine, Serological identity of, 106
—, ——, in bile, 107
—, ——, —— feces, 124
—, ——, —— pharynx in infants, 76
—, ——, living, Immunization of children with, 55
Bacilli, tubercle, Living, necessary for practical immunization, 54
——, ——, Synthesis of tyrosine and tryptophane by, 107
Bacillus, tubercle, defatted strain of, New, for immunization, 57
——, ——, Polymorphism of, 107
——, ——, Viability of, 106
Bacillus-free milk, 58
Bacmeister, A., and Piesbergen, W. Prognosis of pulmonary tuberculosis with cavity, 60
Bacterial cells, Antigenic substances of, 108
Bacteriology of pleural effusions in artificial pneumothorax, 154
Bacteriolysis of tubercle bacilli, 107
Bacteriotherapy in pulmonary tuberculosis, Vaccines and, 23
Bardswell, N. D. Workshops for tuberculous, 147
Baron, L., Valtis, J., Bernard, L., and Salmon, M. Complement fixation in tuberculosis, 129
Baron's operation for tuberculosis of shoulder joint, 142
Bauer, J. Inherited predisposition of child to tuberculosis, 69
Baumann, F. Treatment of tuberculosis with tebeprotin and ectebin, 25
Baylac and Andebert. Artificial pneumothorax and "ventralization" in pregnancy complicated by pulmonary tuberculosis, 14
BCG, Protective inoculation of cattle with, 85
Beilin, P. S. X-ray findings in uncommon causes of hemoptysis, 28
Bendove, R. A. Vital capacity in artificial pneumothorax, 6
Bennighoff, F. Tuberculin reactions in children of play age, 78
Berger, S. S., and Kline, B. S. Treatment of spirochetal pulmonary gangrene with arsphenamine, 19
Bernard, L., Debré, R., and Lelong, M. Results of tuberculosis prophylaxis in young infants, 53
——, ——., Salmon, M., Baron, L., and Valtis, J. Complement fixation in tuberculosis, 129

Bertrand. Vaccines and bacteriotherapy in pulmonary tuberculosis, 23
Beyreuther, H. Aspirated foreign body nine years in lung, 45
Bezançon and Etchegoin. Spirochetes in hemoptoic tuberculous sputum, 29
——, F. Treatment of tuberculosis, 145
——, ——., and Vigneron. Cutaneous tuberculin reactions, 111
——, ——., —— ——, A. Tuberculin skin reactions in adult, 126
——, ——., Azoulay, R., and Chabaud, J. Nervous accidents during course of artificial pneumothorax, 153
Bieling, R., and Isaac, S. Protein decomposition in liver due to tuberculin, 112
Bignami, G. Fornet's diagnostic method, 134
Bilateral renal tuberculosis, 143
Bile and liver in tuberculosis, Chemical study of, 99
——, Tubercle bacilli in, 107
Binet, L., and Roger, G. H. Lipodieresis in lung, 97
Biological tests in prognosis of tuberculosis, Value of, 58
Bisaillon, M., Matson, R. C., and Matson, R. W. Artificial pneumothorax, 152
——, ——., ——, ——. ——., —— ——, ——. ——. Surgical treatment of pulmonary tuberculosis, 150
Blazy, C. Tuberculosis among French Senegalese troops, 62
Bleckschmidt, J., Perlman, H. H., and Cohen, L. S. Acute disseminated bronchopneumonia simulating acute miliary tuberculosis, 40
Block and Aumont. Intensive serotherapy in pulmonary gangrene, 38
Blood and vegetative allergy, 102
—— cholesterin in tuberculosis, 99
——, Effect of spleen extract and bone-marrow on, in pulmonary tuberculosis, 27
——, New constituent of, in tuberculosis, 100
—— of tuberculosis patients, Magnesium and calcium in, 100
—— protein, Effect of tuberculin on, 112
——, sheep, Antibodies to, in tuberculosis, 113
Blood sugar in pulmonary tuberculosis, 100
—— uric acid, Treatment of tuberculosis by increasing, 149
—— vessels, permeability of, Increased, as cause of hemoptysis, 117
Blumenberg, W. Specificity of tuberculin reaction questioned, 127
——, ——., and Möhrke, W. Bacteriolysis of tubercle bacilli, 107
Blumenthal, G. Complement fixation in tuberculosis, 130
Bodies, Foreign, in trachea, 45
——, ——, nonopaque, in bronchi, X-ray diagnosis of, Underexposure in, 45
Body, foreign, nine years in lung, Aspirated, 45
Böhne, A. Pneumonokoniosis and tuberculosis among Ruhr coal miners, 72
Boissel and Courmont, P. Alternating or substituted infections masking pulmonary tuberculosis, 124
Bonafé and Dumarest. Some rare accidents of artificial pneumothorax, 13
Bone and joint tuberculosis, Diazo reaction in, 135
—— —— —— ——, treatment of, X-ray, 141
—— tuberculosis, chronic, Etiology and treatment of, 141
—— ——, Cystic, 142
Bone-marrow, Effect of spleen extract and, on blood in pulmonary tuberculosis, 27
Boquet-Nègre antigen, Treatment of pulmonary tuberculosis with, 148
v. Bornhaupt, N. Treatment of tuberculosis with phlogetan, 23
Both hands, lupus of, Pulmonary tuberculosis and, 144
Bovine tubercle bacilli, Serological identity of human and, 106
—— tuberculin, Intracutaneous tests with human and, 77
—— tuberculosis and milk supply, 86
—— —— in Canada, 84
—— —— —— United States, 84
—— ——, Prevalence of, 84
Bradley, J. I., and Long, P. H. Fate of leucocytes in tuberculin reaction, 101

Braeuning. Tuberculosis following professional care of patients, 73
Bressot. Pericardotomy without drainage in tuberculous pericarditis, 138
Bridgman, E. W., and Norwood, V. Pulmonary tuberculosis and pregnancy, 73
Brittlebank, J. W. Bovine tuberculosis and milk supply, 86
Bronchi, Mycotic infections of, 41
——, nonopaque foreign bodies in, X-ray diagnosis of, Underexposure in, 45
Bronchial drainage by posture, 27
—— lymph nodes, Anthraco-chalicosis of, and bronchitis deformans, 46
Bronchiectasis, diagnosis of, X-ray, 30
——, —— ——, ——, Oils in, 126
——, X-ray study of, 41
Bronchitis deformans, Anthraco-chalicosis of bronchial lymph nodes and, 46
Bronchopleural perforation, Cure of, 140
Bronchopneumonia, Acute disseminated, simulating acute miliary tuberculosis, 40
Brown, G. E., and Rowntree, L. G. Tintometer for skin, 120
Brünecke, K. Diagnosis of hilum tuberculosis in children, 80
Bruner, S. E. Future of tuberculin testing of cattle, 85
Bruns, E. H. Parenchymal râles in pulmonary tuberculosis. 115
Burnand. Cure of bronchopleural perforation, 140
Burndred, E. J. Tuberculous milk, 69
Burrell, L. S. T. Intrathoracic tumors, 47

Cachexia, Tuberculous, 120
Calcification of first rib, Significance of, 114
—— —— pleura, 33
Calcium and tuberculosis, 72
—— in blood of tuberculosis patients, Magnesium and, 100
——, Serum, in pulmonary tuberculosis, 96
——, ——, —— tuberculosis, 100
Caldwell, M. E. Viability of tubercle bacillus, 106
Callosities, pleural, Cartilaginous, at pulmonary apices, 89
Calmette, A., *et al.* Immunization with vaccine of Calmette and Guérin, 55
Calmette and Guérin, Immunization with the vaccine of, 55
Camp, military training, citizens', Vital capacity in. 118
Camphor (hexeton), Treatment of pulmonary tuberculosis with, 20
——, Treatment of tuberculosis with, 21
Canada, Bovine tuberculosis in, 84
Cancer and acquired resistance to tuberculosis, 50
—— —— tuberculosis, 50
Capacity, Vital, in artificial pneumothorax, 6
——, ——, —— citizens' military training camp, 118
Carbon dioxide and growth of acid-fast bacilli, 104
——, lime and silicic acid, Treatment of pulmonary tuberculosis by inhalation of, 26
Carcinoma of lung, Primary, 48, 49
—— —— ——, upper-lobe, Diagnosis of, 49
Care of patients, professional, Tuberculosis following, 73
—— —— tuberculosis, Post-sanatorium, 146
——, Post-sanatorium, of tuberculosis, 146
Carpenter, C. M., and Schoenfeld, A. S. Mixed infection in guinea pigs, 87
Cartilaginous pleural callosities at pulmonary apices, 89
Carty, J. R., and Liebman, C. Empyema in children, 30
Case of severe tuberculous infection, 135
Cases, Segregation of, in sanatoria, 146
Castellani, A. Mycotic infections of bronchi, 41
Cat, Tuberculous choroiditis in, 87
Cattle, complement-fixation test in, Wassermann's, 86
——, imported, in England, Tuberculin tests on, 84
——, Protective inoculation of, 85
——, —— —— ——, with *BCG*, 85
——, range, Testing, with tuberculin, 84
——, tuberculin testing of, Future of, 85
——, Tuberculosis and adequate diet for, 85
——, tuberculous infection in, Suppression of, 85
Cause of hemoptysis, Increased permeability of blood vessels as, 117

Cause of preponderance of right-sided apical pulmonary tuberculosis, 89
Causes of hemoptysis, uncommon, X-ray findings in, 28
Caussade, G., Tardieu, A., and Grigaut, A. Intravenous injections of oil in rabbit, 104
Caussimon, J. Menstrual fever in tuberculosis, 118
Cavities, Healing of, in pulmonary tuberculosis, 90
Cavity, Healing of, 90
—— in infants, Pulmonary tuberculosis with, 76
——, pulmonary tuberculosis with, Prognosis of, 60
Cells, bacterial, Antigenic substances of, 108
——, epithelioid, Development of, from leucocytes, 95
Cellular reaction to tubercle bacillus, 91
Certified herds, Milk and, 57
Chabaud, J., Bezançon, F., and Azoulay, R. Nervous accidents during course of artificial pneumothorax, 153
Chalier and Schoen. Tuberculous meningitis following trauma, 144
Changes in leucocytes during tuberculin treatment, 116
—— —— liver in tuberculosis elsewhere, 98
——, Pathological, in lung, from mercurochrome, 21
——, Specific, in regional lymph nodes in phthisis, 90
——, Toxic in surgical tuberculosis, 141
Characteristics, Inherited physical and psychic, in tuberculosis, 69
Chatellier, Vallat and Hude. Tuberculosis of epiglottis, 137
Chemical industries, Tuberculosis in, 72
—— study of bile and liver in tuberculosis, 99
Chemotherapeutic experiments in tuberculosis of guinea pigs, 15
Chemotherapy in tuberculosis, Specific, 15
Cherry, T. Cancer and acquired resistance to tuberculosis, 50
Chest examination, Improved X-ray technique in, 123
——, X-ray of, Value of, in tuberculosis suspects, 122
Child, Inherited predisposition of, to tuberculosis, 69
——, tuberculosis in, Disseminated, 82
Childhood, Artificial pneumothorax in pulmonary tuberculosis, 4
——, pulmonary tuberculosis in, symptoms of, Early, 80
——, Tuberculosis in, 76
——, —— ——, symptoms of, Early, 80
Children, Artificial pneumothorax in, 82
——, cough in, chronic, treatment of, X-ray, 34
——, Demineralization coefficient in normal and tuberculous, 83
——, Empyema in, 30
——, Hilum enlargements in, 80
——, —— tuberculosis in, Diagnosis of, 80
——, Immunization of, with living tubercle bacilli, 55
——, malnutrition in, Relation of tuberculosis to, 79
—— of play age, Tuberculin reactions in, 78
——, Ontario, Tuberculosis survey of, 77
——, Pirquet-positive, Weight of, 79
——, school, of Westphalia, Tuberculous infection in, 78
——, ——, tuberculosis among, Hygienic and economic factors in, 79
——, tuberculin-positive, Wheal formation in, 82
——, Tuberculosis in, 76
——, —— ——, ambulant, Epidemiology of, 77
——, —— ——, ——, Types of, 81
——, —— ——, surgical, Treatment of, with Krysolgan, 83
——, —— ——, Treatment of, with Sanocrysin, 162
——, tuberculous, Exercise for, 83
——, —— milk and, 79
——, ——, serum of, Lipase titre of, 83
——, ——, Spread of droplets by, 79
——, ——, Thoracic form and function in, 82
Cholesterin, Blood, in tuberculosis, 99
Choroiditis, Tuberculous, in cat, 87
Christophe, J., and de Jong, I. Treatment of chronic pulmonary tuberculosis with iodine, 18

Chronic bone tuberculosis, Etiology and treatment of, 141
—— cough in children, treatment of, X-ray, 34
—— localized tuberculosis, 89
—— pulmonary tuberculosis, Treatment of, with iodine, 18
Churchill, E. D. Pulmonary reëxpansion in empyema, 43
Citizens' military training camp, Vital capacity in, 118
Classification of pulmonary tuberculosis, 60
Clauberg, K. W. Fatty liver of phthisis, 99
Clean milk, 58
Clinical hilum tuberculosis, Diagnosis of, 139
Clots, Fibrin, in pneumothorax, 90
Coagulen, Treatment of hemoptysis with, 20
Coal miners, Ruhr, tuberculosis among, Pneumonokoniosis and, 72
Coefficient, Demineralization, in normal and tuberculous children, 83
Cohen, L. S., Bleckschmidt, J., and Perlman, H. H. Acute disseminated bronchopneumonia simulating acute miliary tuberculosis, 40
Cohn, A. Daranyi reaction, 133
Cold abscess following Albee operation, Paraplegia from, 143
Colds, Significance of, in tuberculosis, 37
Collapse of lung, Therapeutic, 151
——, pulmonary, Massive, 44
Collapsed by artificial pneumothorax, Evolution of tuberculosis in lungs, 4
Colloidal copper, Treatment of tuberculosis with, 18
Complement fixation, Effect of tuberculin on, 128
—— —— in diagnosis of tuberculous exudates, 130
—— —— —— tuberculosis, 128, 129, 130
—— —— —— —— with antigens from acid-fast saprophytes, 105
—— —— test, Wassermann's, in cattle, 86
Complex, Primary, 88
——, Ranke's primary, Low incidence of, 87
Congenital cystic disease of lungs, 33
—— cysts of lung, 33
Conjunctiva, tuberculosis of, Primary, 135
Conjunctiva, Tuberculous infection by mouth, nose and, 70
Connerth, O. Prognosis of scrofula, 135
Conquest of tuberculosis, 66
Consolidation of lung, Acute, 29
Constituent of blood in tuberculosis, New, 100
Contagiousness of tuberculosis patients, 67
Conte, Labry and Delore. Hemicolectomy in ileocecal tuberculosis, 140
Contraindications, Indications and, of artificial pneumothorax in pulmonary tuberculosis, 2
Control of tuberculosis, Milk supply and, 58
Copper, colloidal, Treatment of tuberculosis with, 18
Corby, J., Escallier, and Pogniez, P. Tuberculous meningitis simulating epidemic encephalitis, 144
Corone, A. Sulphurous thermal cure of pulmonary tuberculosis, 149
Corper, H. J. Pathological changes in lung from mercurochrome, 21
——, ——. ——., and Hektoen, L. Antibodies to sheep blood in tuberculosis, 113
(Cortalit), Treatment of pulmonary tuberculosis with oak-bark, 21
Cottenot, P., and Sergent, E. Diagnostic value of lipiodol, 125
Cough droplets, Dissemination of, in phthisis, 71
—— ——, Infection from, most important, 71
—— in children, chronic, treatment of, X-ray, 34
Coulaud, E. Successful double artificial pneumothorax, 4
Courmont, P., and Boissel. Alternating or substituted infections masking pulmonary tuberculosis, 124
Course of artificial pneumothorax, Nervous accidents during, 153
Cows, tuberculin-reacting, Lesions of teats in, 84
Craver, L. F. Metastatic tumors of lung simulating acute respiratory disease, 50
Crozer-Griffith, J. P. Massive pulmonary collapse, 44
Cultivation of tubercle bacilli and acid-fast saprophytes from sputum, 124

Cultures on potato media, Sections through, 107
Cumming, W. M. Serological identity of human and bovine tubercle bacilli, 106
Cummins, S. L. Milk supply and control of tuberculosis, 58
——, ——. ——. Prevention of tuberculosis, 52
Cunningham, R. S., Sabin, F. R., Sugiyama, S., and Kindwall, J. A. Rôle of monocyte in tuberculosis, 92
Cure of bronchopleural perforation, 140
——, Sulphurous thermal, of pulmonary tuberculosis, 149
Curschmann, W. Classification of pulmonary tuberculosis, 60
Cutaneous tuberculin reactions, 111
Cutis, tuberculosis verrucosa, Stovarsol for, 163
Cystic bone tuberculosis, 142
—— disease of lungs, Congenital, 33
Cysts, hydatid, of lung, Treatment of, 34
—— of lung, Congenital, 33
—— —— ——, hydatid, diagnosis of, X-ray, 33
Czerny, A. Tuberculosis in childhood, 76
—— and Opitz. Treatment of tuberculosis in children with sanocrysin, 162
Czickli, H., and Haller, R. Different tuberculin diagnostic methods, 126
Czyhrlarz, E., and Pick, E. Percussion of apices of lungs, 122
——, ——., —— ——, ——. Puncture of lung in diagnosis, 121

Danger of tuberculous infection, 67
Dangers of tuberculous milk, 70
Daranyi reaction, 133
——, Red-cell sedimentation and, reactions, 133
Dead tubercle bacilli, Immunization of infants with, 57
—— —— ——, —— with, 56
Death following pleural puncture in artificial pneumothorax, Sudden, 14
Debré, R., and Lelong, M. Heredity in tuberculosis, 68
——, ——., Lelong, M., and Bernard, L. Results of tuberculosis prophylaxis in young infants, 53
Decomposition, Protein, in liver, due to tuberculin, 112
Defatted strain of tubercle bacillus for immunization, New, 57
Deist, H. Value of Ambard constant in tuberculosis, 130
——, ——., and Schröder, G. X-ray treatment of pulmonary and laryngeal tuberculosis, 159
Delore, Conte and Labry. Hemicolectomy in ileocecal tuberculosis, 140
——, F., and Jouve. Paraplegia from cold abscess following Albee operation, 143
Demineralization coefficient in normal and tuberculous children, 83
Demonstration of tubercle bacilli in suspected material, 123
D'Espine's sign, 122
Determination of pleural pressures in artificial penumothorax, 9
Deuel, P. Pleurisy in artificial pneumothorax, 12
Development of epithelioid cells from leucocytes, 95
—— —— tubercles *in vitro*, 91
Deviations of esophagus in pulmonary tuberculosis, 114
DeVloo. Indications and contraindications of artificial pneumothorax in pulmonary tuberculosis, 2
——. Therapeutic collapse of lung, 151
Diabetes with tuberculosis, Insulin in, 52
Diagnosis, early, of pulmonary tuberculosis, Importance of history in, 121
——, ——, —— tuberculosis, 120
—— of activity in pulmonary tuberculosis, 121
—— —— bronchiectasis, X-ray, 30
—— —— ——, ——, Oils in, 126
—— —— clinical hilum tuberculosis, 139
—— —— hilum tuberculosis in children, 80
—— —— hydatid cysts of lung, X-ray, 33
—— —— nonopaque foreign bodies in bronchi, X-ray, Underexposure in, 45
—— —— pneumothorax, topographical, Lipiodol for, 125
—— —— pulmonary tuberculosis, 120
—— —— —— ——, Reaction of eosinophiles to tuberculin in, 127

Diagnosis of pulmonary tuberculosis, X-ray, Limitations of, 123
—— —— surgical tuberculosis, 140
—— —— tuberculosis, Early, 120
—— —— —— in infancy, Difficulties in, 75
—— —— tuberculous exudates, Complement fixation in, 130
—— —— upper-lobe carcinoma of lung, 49
——, pulmonary, Lipiodol in, 126
——, ——, Soft X-ray technique in, 123
——, Puncture of lung in, 121
——, X-ray, of bronchiectasis, 30
——, ——, —— ——, Oils in, 126
——, ——, —— hydatid cysts of lung, 33
——, ——, —— nonopaque foreign bodies in bronchi, Underexposure in, 45
——, ——, —— pulmonary tuberculosis, Limitations of, 123
Diagnostic method, Fornet's, 134
—— methods, tuberculin, Different, 126
—— value of lipiodol, 125
Diazo reaction in bone and joint tuberculosis, 135
—— —— —— tuberculosis, 134
Diet, adequate, for cattle, Tuberculosis and, 85
—— in experimental tuberculosis, 105
Dietaries, Sanatorium, 146
Dietetic treatment of tuberculosis, 145
—— —— —— ——, Minerals in, 146
Different tuberculin diagnostic methods, 126
Difficulties in diagnosis of tuberculosis in infancy, 75
Disease of teeth, Scrofula and, 136
Disinfectant for sputum, new, Sputamin, 58
Disinfection of tuberculous sputum with parmetol, 58
—— —— —— —— —— —— and alkallysol, 58
Dispensaries, Tuberculosis nomenclature for, 61
Displacement of mediastinal shadow, 115
Disseminated bronchopneumonia, Acute, simulating acute miliary tuberculosis, 40
—— tuberculosis in child, 82
Dissemination of cough droplets in phthisis, 71
Distress after thoracoplasty, Severe respiratory, 155
Dixon, W. E. Specific chemotherapy in tuberculosis, 15
Doctojonan, Treatment of pulmonary tuberculosis with, 21
Dog, Tuberculosis of, 87
Dogs, normal, Lung markings of, 90
Donaldson, S. W. Underexposure in X-ray diagnosis of nonopaque foreign bodies in bronchi, 45
Dor, A. Suppuration of renal pelvis following nephrectomy, 143
Dornnedden, H. Leucocytes in tuberculosis, 116
Double artificial pneumothorax, Successful, 4
Downing, H. F., and Higgins, H. L. Intracutaneous tests with human and bovine tuberculin, 77
Drainage, Bronchial, by posture, 27
——, Pericardotomy without, in tuberculous pericarditis, 138
Dreyer's antigen in experimental tuberculosis, 24
—— tubercle antigen and experimental tuberculosis, 23
Droplet or dust infection in tuberculosis, 70
Droplets, cough, Dissemination of, in phthisis, 71
——, ——, Infection from, most important, 71
——, Spread of, by tuberculous children, 79
Drugs, Treatment of experimental pulmonary hemorrhage with, 16
——, —— —— tuberculosis with, 16
——, —— —— —— —— certain, 17
Dry inhalation, Treatment of pulmonary tuberculosis by, 149
Due to allergy, Inflammation, 111
—— —— tuberculin, Protein decomposition in liver, 112
Dufour and Vellaz. Demineralization coefficient in normal and tuberculous children, 83
Dufourt, A. Polymorphism of tubercle bacillus, 107
Düll, W. Fibrin clots in pneumothorax, 90
——, ——. Treatment of pulmonary tuberculosis with krysolgan, 17
Dumarest and Bonafé. Some rare accidents of artificial pneumothorax, 13

Dunham, E. C., and Smythe, A. M. Tuberculosis of abdominal lymph nodes, 81
Dunham, R. W. Effect of spleen extract and bone-marrow on blood in pulmonary tuberculosis, 27
Durand, H., and Charchanski. Bacteriology of pleural effusions in artificial pneumothorax, 154
Dust infection in tuberculosis, Droplet or, 70
—— —— most probable in tuberculosis, 71
Dutton, W. F. Treatment of pulmonary tuberculosis with certain drugs, 17

Early diagnosis of pulmonary tuberculosis, Importance of history in, 121
—— —— —— tuberculosis, 120
—— signs of tuberculosis, 115
—— symptoms of pulmonary tuberculosis in childhood, 80
—— —— —— tuberculosis in childhood, 80
—— tuberculosis, pain in, Thoracic, 119
Economic factors in tuberculosis among school children, Hygienic and, 79
Ectebin, Treatment of tuberculosis with, 24, 148
——, —— —— —— —— tebeprotin and, 25
Effect of lead on experimental tuberculosis, 105
—— —— metallic salts on experimental tuberculosis, 163
—— —— Moellgaard's serum in tuberculous animals, 162
—— —— spleen extract and bone-marrow on blood in pulmonary tuberculosis, 27
—— —— tuberculin injections on enuresis, 112
—— —— —— on blood protein, 112
—— —— —— —— complement fixation, 128
Effects of rainbearing winds on pulmonary tuberculosis, 73
—— —— war gasses on lungs, Experimental, 34
Effler. Weight of Pirquet-positive children, 79
Effusions in artificial pneumothorax, Prevention of, 13
—— —— —— ——, Treatment of, 13
——, pleural, Bacteriology of, in artificial pneumothorax, 154
Eggerth, A. H., and Feinblatt, H. M. Dreyer's tubercle antigen and experimental tuberculosis, 23
Elimination of volatile substances, Absorption and, 97
Elliott, J. H. Tuberculosis survey of Ontario children, 77
Embolism, air, Fatal, in artificial pneumothorax, 14
——, ——, in artificial pneumothorax, 154
Emery, E. S., Jr., and Monroe, R. T. Value of X-ray of chest in tuberculosis suspects, 122
Emile-Weil, Isch-Wall and Pollet. Leukemia and tuberculosis, 51
Emphysema of skin and mediastinum in pulmonary tuberculosis, 90
Empyema in children, 30
——, interlobar, thoracoplasty in, Partial, 44
——, reëxpansion in, Pulmonary, 43
Emulsions of testes and adrenals in treatment of tuberculosis, 26
Encephalitis, epidemic, Tuberculous meningitis simulating, 144
End-results of artificial pneumothorax, 155
Engel, S. Early symptoms of tuberculosis in childhood, 80
England, Tuberculin tests on imported cattle in, 84
Enlargements, Hilum, in children, 80
Enuresis, Effect of tuberculin injections on, 112
Eosinophiles, Reaction of, to tuberculin, in diagnosis of pulmonary tuberculosis, 127
Epidemic encephalitis, Tuberculous meningitis simulating, 144
Epidemiology of ambulant tuberculosis in children, 77
Epiglottis, Tuberculosis of, 137
Epithelioid cells, Development of, from leucocytes, 95
Epstein, D. Permanent results of artificial pneumothorax, 155
Ertuban, Treatment of tuberculosis with, 25
Escallier, Pogniez, P., and Corby, J. Tuberculous meningitis simulating epidemic encephalitis, 144
Esophagus, Deviations of, in pulmonary tuberculosis, 114

Etchegoin and Bezançon. Spirochetes in hemoptoic tuberculous sputum, 29
Etiological factor in otitis media, Tuberculosis as, 135
—— factors in tuberculosis, 67
Etiology and treatment of chronic bone tuberculosis, 141
—— of serous pleurisy, 140
Evolution of tuberculosis in lungs collapsed by artificial pneumothorax, 4
Exairesis of phrenic nerve, 156
—— —— —— —— in treatment of pulmonary tuberculosis, 1, 155
Examination, chest, Improved X-ray technique in, 123
——, X-ray, of apices, Technique of, 123
Exchange, Respiratory, in experimental tuberculosis, 96
Exercise for tuberculous children, 83
Experimental effects of war gases on lungs, 34
—— pulmonary hemorrhage, Treatment of, with drugs, 16
—— tuberculosis, Diet in, 105
—— ——, Dreyer's antigen in, 24
—— ——, —— tubercle antigen and, 23
—— ——, Effect of lead on, 105
—— ——, —— —— metallic salts on, 163
—— ——, Respiratory exchange in, 96
—— ——, Treatment of, with krysolgan, 18
Extracts, Tissue, in tuberculosis, 102
Exudate, Injection of, as aid to artificial pneumothorax, 149
Exudates, tuberculous, diagnosis of, Complement fixation in 130
Exudative infiltrations of primary and secondary pulmonary tuberculosis, 89

Faber, K. Treatment of pulmonary tuberculosis with sanocrysin, 16
Factors, Etiological, in tuberculosis, 67
——, Hygienic and economic, in tuberculosis among school children, 79
Factory ventilation and industrial tuberculosis, 71
Falk, W. Origin of phthisis of puberty, 67
Family history and prognosis of pulmonary tuberculosis, 59
Fat and lipoid antibodies in tuberculosis, 113
Fatal air embolism in artificial pneumothorax, 14
Fate of leucocytes in tuberculin reaction, 101
Fats and lipoids in foci of pulmonary tuberculosis, 96
Fatty liver of phthisis, 99
Feces, Tubercle bacilli in, 124
Feinblatt, H. M., and Eggerth, A. H. Dreyer's tubercle antigen and experimental tuberculosis, 23
Fever, Menstrual, in tuberculosis, 118
—— reactions, Psychic, in tuberculosis, 119
Fibrin clots in pneumothorax, 90
Fibrosing pleurisy in artificial pneumothorax, 14
Fibrosis, pulmonary, Nontuberculous 31
Findings, X-ray, in uncommon causes of hemoptysis, 28
First rib, calcification of, Significance of, 114
Fischer, W. Case of severe tuberculous infection, 135
Fisher, M. K. X-ray treatment of chronic cough in children, 34
Fistula, pleural, Ultraviolet light for, 157
——, urethrorectal, Tuberculosis of rectum with, 143
Flocculation reaction in tuberculosis, 133
Fluoroscopy in artificial pneumothorax, 11
Focal tuberculin hypersensitiveness, 110
Foci of pulmonary tuberculosis, Fats and lipoids in, 96
Focke, F. Cartilaginous pleural callosities at pulmonary apices, 89
Fodor, E., and Weisz, A. Symptomatology of tuberculous mediastinal pleurisy, 140
Following Albee operation, Paraplegia from cold abscess, 143
—— nephrectomy, Suppuration of renal pelvis, 143
—— professional care of patients, Tuberculosis, 73
—— trauma, Tuberculous meningitis, 144
Fontan. Respiratory exchange in experimental tuberculosis, 96
Foot, N. C. Formation of reticulum in tubercles, 95
Ford, A. P. Family history and prognosis of pulmonary tuberculosis, 59
Foreign bodies in bronchi, nonopaque, X-ray diagnosis of, Underexposure in, 45
—— —— —— trachea, 45

Foreign body nine years in lung, Aspirated, 45
Form and function, Thoracic, in tuberculous children, 82
Formation of reticulum in tubercles, 95
Fornet's diagnostic method, 134
Foubert and Ménard. Ultraviolet light in pulmonary tuberculosis, 156
Fractions of tubercle bacilli, Anatomic reactions to, 91
French Senegalese troops, Tuberculosis among, 62
Frequency of tuberculous infection at school age, 77
Freund, A. Air embolism in artificial pneumothorax, 154
——, ——. Red-cell sedimentation reaction, 128
Friedland, M. Influence of light on growth of tubercle bacilli, 107
v. Frisch, A. V. Effect of tuberculin on blood protein, 112
——, ——. ——. Intravenous injections of tuberculin, 112
——, ——. ——. Red-cell sedimentation reaction in tuberculosis, 59
——, ——. ——. Time factors in tuberculin reaction, 127
Function, Thoracic form and, in tuberculous children, 82
Fürbringer, V. Sputum staining methods, 124
Future of tuberculin testing of cattle, 85
—— —— tuberculosis, 61

Gäbert. Technique of X-ray examination of apices, 123
Galatzer, N., and Sachs, A. Treatment of pulmonary tuberculosis with triphal, 18
Gangrene, pulmonary, Serotherapy and vaccinotherapy in, 37
——, ——, —— in, Intensive, 38
——, ——, spirochetal, Treatment of, with arsphenamine, 19
Gases, war, effects of, on lungs, Experimental, 34
——, ——, sequellae of, Respiratory, 35
Gauvain, H. Artificial light treatment, 157
Gehrcke, A., and Lorey, A. X-ray treatment of pulmonary tuberculosis, 159
Gehrcke, A. Healing of tuberculous meningitis, 144
Geiger, J., and Sobel, J. Disseminated tuberculosis in child, 82
Geissler, O. Prevention of tuberculosis in infants, 53
——, ——. Recent increase of tuberculosis mortality in Germany, 65
Genersich, A. Pressure relations in pleural space, 99
Genesis of tuberculosis in infants, Anatomy and, 76
Genévrier, J. Lipiodol for topographical diagnosis of pneumothorax, 125
Gerber, P. Tuberculosis among war veterans, 66
Germany, tuberculosis in, Present status of, 65
——, —— mortality in, Recent increase of, 65
Gerson, M., Sauerbruch, F., and Hermannsdorfer, A. Dietetic treatment of tuberculosis, 145
Geszti, J. Cause of preponderance of right-sided apical tuberculosis, 89
Ghon, A., Kudlich, H., and Winternitz, F. Anatomy and genesis of tuberculosis in infants, 76
——, ——. Pulmonary tuberculosis with cavity in infants, 76
Giegler, G. Healing of cavities in pulmonary tuberculosis, 90
Gierthmühlen, F. Karfunkel's vaccine in tuberculosis, 24
Gilkey, H. M. Miliary tuberculosis in infant twenty-eight days old, 76
Giraud, A., and de Reynier, L. Patency and permeability of air passages in artificial pneumothorax, 5
——, ——., Perret, C. A., and Pirquet, C. A. Exairesis of phrenic nerve in treatment of pulmonary tuberculosis, 1
Glogauer, O., and Landau, W. Blood sugar in pulmonary tuberculosis, 100
Gloyne, S. R. Pulmonary lesions simulating tuberculosis, 38
Gödde, H. Treatment of pulmonary tuberculosis with Ponndorf's method, 25
Goldmann, F., and Wolff, G. Tuberculosis of aged, 62

Gordon, W. Effects of rainbearing winds on pulmonary tuberculosis, 73
Götz, H. Thoracic form and function in tuberculous children, 82
Götzl, A. Tuberculosis and health insurance, 62
Grady, H. W. Intratracheal injections of lipiodol, 126
Graham, E. A., and Singer, J. J. X-ray study of bronchiectasis, 41
Grass, H. Segregation of cases in sanatoria, 146
——, ——. Treatment of pulmonary tuberculosis with oak-bark (cortalit), 21
Grasset, E. Dreyer's antigen in experimental tuberculosis, 24
Gray, H. Spontaneous tuberculosis in rabbits, 87
Greenberg, D. Primary malignant tumors of lung, 48
Griffith, A. S. Dangers of tuberculous milk, 70
Grigaut, A., Caussade, G., and Tardieu, A. Intravenous injection of oil in rabbit, 104
Grove, J. S., and Kramer, S. E. Primary carcinoma of lung, 48
Growth, Anaerobic, of tubercle bacilli, 106
—— of acid-fast bacilli, Carbon dioxide and, 104
—— —— tubercle bacilli, Influence of light on, 107
Grube, F. Red-cell sedimentation reaction, 132
Gruschka, T., and Guth, E. Effect of tuberculin on complement fixation, 128
Guérin, M. C. Protective inoculation of cattle with *BCG*, 85
Guide of activity, Matefy reaction as, 134
Guinard, L. Methylic antigen as adjuvant in treatment of tuberculosis, 147
Guinea-pig tuberculosis, Treatment of, with specific vaccine, 26
Guinea pigs, Chemotherapeutic experiments in tuberculosis of, 15
—— ——, Mixed infection in, 87
—— ——, Tuberculous infection of testicle in, 104
Gum, Non-protein, from tuberculin, 110
v. Gutfeld, F., and Weigert, E. Complement fixation in tuberculosis, 129
Guth, E., and Gruschka, T. Effect of tuberculin on complement fixation, 128
Guth, E. Complement fixation in tuberculosis, 129
——, ——. Diagnosis of activity in pulmonary tuberculosis, 121
——, ——. Vegetative allergy in tuberculosis, 111

Haardt, W. Surgical treatment of laryngeal tuberculosis, 136
Haeger, E. Post-sanatorium care of tuberculosis, 146
Hager, E. Meinicke reaction for syphilis, 51
——, ——. Value of biological tests in prognosis of tuberculosis, 58
Hailer, E., and Uhlenhuth, P. Sputamin, new disinfectant for sputum, 58
——, ——., Jötten, K. W., and Uhlenhuth, P. Disinfection of tuberculous sputum with parmetol, 58
Haim, A. Tubercle formation and skin reactions in pigs, 86
Halir, O., and Kettner, A. Blood and vegetative allergy, 102
Haller, R., and Czickli, H. Different tuberculin diagnostic methods, 126
Hamburger, F. More accurate study of tuberculosis desirable, 62
Hands, lupus of both, Pulmonary tuberculosis and, 144
Hass, J. X-ray treatment of bone and joint tuberculosis, 141
Hauke, H. Severe respiratory distress after thoracoplasty, 155
Hawes, J. B., 2nd. Diagnosis of clinical hilum tuberculosis, 139
——, ——. ——., ——. Heliotherapy, 156
v. Hayek, H. Diagnosis of pulmonary tuberculosis, 120
——, ——. Interruption of pregnancy in tuberculosis, 27
Heaf, F. R. G. Simple method of obtaining skiagrams in artificial pneumothorax, 10
Healing of cavities in pulmonary tuberculosis, 90
—— —— cavity, 90
—— —— tuberculous meningitis, 144
Health insurance, Tuberculosis and, 62
Heart disease, Tuberculosis and, 137

Hecker, E., and Vierhaus, J. Lipase titre of serum of tuberculous children, 83
Heilmann, P. Low incidence of Ranke's primary complex, 87
Hektoen, L., and Corper, H. J. Antibodies to sheep blood in tuberculosis, 113
Heliotherapy, 156
——, instrument for, New, 156
Hemicolectomy in ileocecal tuberculosis, 140
Hemophiliac, Renal tuberculosis in, 143
Hemoptoic tuberculous sputum, Spirochetes in, 28
Hemoptysis, 116
——, Artificial pneumothorax in, 154
——, cause of, Increased permeability of blood vessels as, 117
——, Treatment of, with coagulen, 20
——, X-ray findings in uncommon causes of, 28
Hemorrhage, pulmonary, experimental, Treatment of, with drugs, 16
Henderson, Y. Absorption and elimination of volatile substances, 97
Henius, K. Treatment of pulmonary tuberculosis by inhalation of carbon, lime and silicic acid, 26
——. Treatment of tuberculosis with krysolgan, 18
Herds, certified, Milk and, 57
Heredity in tuberculosis, 68
Hermannsdorfer, A., Gerson, M., and Sauerbruch, F. Dietetic treatment of tuberculosis, 145
——, ——. Minerals in dietetic treatment of tuberculosis, 146
Heuser, C. X-ray diagnosis of hydatid cysts of lung, 33
(Hexeton), Treatment of pulmonary tuberculosis with camphor, 20
Heymann, K. Stovarsol for tuberculosis verrucosa cutis, 163
Higgins, H. L., and Downing, H. F. Intracutaneous tests with human and bovine tuberculin, 77
High altitudes, Leucocytes in pulmonary tuberculosis at, 100
—— leucocytosis in tuberculosis, 145
Highberger, J., and Rockwell, G. E. Carbon dioxide and growth of acid-fast bacilli, 104
Hillenberg. Phthisiogenesis and prophylaxis of pulmonary tuberculosis, 54
Hilum enlargements in children, 80
—— tuberculosis, clinical, Diagnosis of, 139
—— —— in children, Diagnosis of, 80
History, Family, and prognosis of pulmonary tuberculosis, 59
——, Importance of, in early diagnosis of pulmonary tuberculosis, 121
Hochstetter. Fatal air embolism in artificial pneumothorax, 14
Hoffmann, A. Tuberculous infection in school children of Westphalia, 78
Hoffmann, W. Bilateral renal tuberculosis, 143
——, ——. Renal tuberculosis treated conservatively, 143
Hoffstaedt, E. Etiological factors in tuberculosis, 67
Hollmann, R. Infectiousness of saliva in pulmonary tuberculosis, 71
Hornung, P. Tuberculin skin reactions, 126
Hornung, R. Vaginal hysterectomy under local anesthesia in pulmonary tuberculosis, 163
Howk, H. J. Tuberculosis and heart disease, 137
Hude, Chatellier and Vallat. Tuberculosis of epiglottis, 137
Hudson, B. Soft X-ray technique in pulmonary diagnosis, 123
——, ——. Treatment of effusions in artificial pneumothorax, 13
Huebschmann. Early symptoms of tuberculosis in childhood, 80
Human and bovine tubercle bacilli, Serological identity of, 106
—— —— —— tuberculin, Intracutaneous tests with, 77
Hydatid cysts of lung, diagnosis of, X-ray, 33
—— —— —— ——, Treatment of, 34
Hygienic and economic factors in tuberculosis among school children, 79
Hypersensitiveness, tuberculin, Focal, 110
Hysterectomy, Vaginal, under local anesthesia, in pulmonary tuberculosis, 163

Identity of human and bovine tubercle bacilli, Serological, 106

Ignatowski, A. I., and v. Lemesic, M. Secondary tuberculosis, 88
Ignipuncture, Treatment of lupus vulgaris by, 145
Ileocecal tuberculosis, Hemicolectomy in, 140
Immunization against tuberculosis impossible, Practical, 57
——, New defatted strain of tubercle bacillus for, 57
—— of children with living tubercle bacilli, 55
—— —— infants with dead tubercle bacilli, 57
——, practical, Living tubercle bacilli necessary for, 54
—— with dead tubercle bacilli, 56
—— —— vaccine of Calmette and Guérin, 55
Importance of history in early diagnosis of pulmonary tuberculosis, 121
Imported cattle in England, Tuberculin tests on, 84
Improved X-ray technique in chest examination, 123
Incidence, Low, of Ranke's primary complex, 87
Increase of tuberculosis mortality in Germany, Recent, 65
Increased by lipoids, Tuberculin reactivity, 112
—— permeability of blood vessels as cause of hemoptysis, 117
Increasing blood uric acid, Treatment of tuberculosis by, 149
Indications and contraindications of artificial pneumothorax in pulmonary tuberculosis, 2
—— for phrenicotomy, New, 156
Industrial tuberculosis, Factory ventilation and, 71
Industries, chemical, Tuberculosis in, 72
Infancy, tuberculosis in, diagnosis of, Difficulties in, 75
Infant twenty-eight days old, Miliary tuberculosis in, 76
Infants, cavity in, Pulmonary tuberculosis with, 76
——, Immunization of, with dead tubercle bacilli, 57
Infants, Tubercle bacilli in pharynx in, 76
——, tuberculosis in, Anatomy and genesis of, 76
——, —— ——, Prevention of, 53
——, young, tuberculosis prophylaxis in, Results of, 53
Infection, Droplet or dust, in tuberculosis, 70
——, Dust, most probable in tuberculosis, 71
—— from cough droplets most important, 71
——, Mixed, in guinea pigs, 87
——, secondary, in pulmonary tuberculosis, X-ray of, 40
——, tuberculous, at school age, Frequency of, 77
——, ——, by mouth, nose and conjunctiva, 70
——, ——, Danger of, 67
——, ——, in cattle, Suppression of, 85
——, ——, —— school children of Westphalia, 78
——, ——, of testicle, in guinea pigs, 104
——, ——, Route of, 70
——, ——, severe, Case of, 135
Infections, Alternating or substituted, masking pulmonary tuberculosis, 124
——, Mycotic, of bronchi, 41
Infectiousness of saliva in pulmonary tuberculosis, 71
—— —— tuberculosis, 67
Infiltrations, Exudative, of primary and secondary pulmonary tuberculosis, 89
——, tuberculous, Anthracotic, of apex, 89
Inflammation due to allergy, 111
Influence of light on growth of tubercle bacilli, 107
Inhalation, dry, Treatment of pulmonary tuberculosis by, 149
—— of carbon, lime and silicic acid, Treatment of pulmonary tuberculosis by, 26
Inherited physical and psychic characteristics in tuberculosis, 69
—— predisposition of child to tuberculosis, 69
Injection of exudate as aid to artificial pneumothorax, 149
Injections, Intratracheal, of lipiodol, 126
——, Intravenous, of oil, in rabbit, 104
——, ——, —— tuberculin, 112
——, nerve, Alcoholic, for relief of laryngeal and pleuritic pain, 164

Inoculation, Intrauterine, of acid-fast bacilli, 103
——, Protective, of cattle, 85
——, ——, —— —— with *BCG*, 85
Instrument for heliotherapy, New, 156
Insulin in diabetes with tuberculosis, 52
Insurance, health, Tuberculosis and, 62
Intellectual weapons in tuberculosis, 66
Intensive serotherapy in pulmonary ganrene, 38
Interlobar empyema, thoracoplasty in, Partial, 44
Interruption of pregnancy in pulmonary tuberculosis, Radical, 28
—— —— —— —— tuberculosis, 27
Intracutaneous tests with human and bovine tuberculin, 77
Intrapleural respiratory tracings in artificial pneumothorax, Thoracic and, 9
Intrathoracic lymphadenopathy, 138
—— tumors, 47
Intratracheal injections of lipiodol, 126
Intrauterine inoculation of acid-fast bacilli, 103
Intravenous injections of oil in rabbit, 104
—— —— —— tuberculin, 112
In vitro, Development of tubercles, 91
Iodine, Treatment of chronic pulmonary tuberculosis with, 18
——, —— —— tuberculous pyopneumothorax with, 19
Irk, V. C. Lipatren treatment of surgical tuberculosis, 148
Irritation treatment of tuberculosis, 147
Isaac, S., and Bieling, R. Protein decomposition in liver due to tuberculin, 112
Isch-Wall, Pollet and Emile-Weil. Leukemia and tuberculosis, 51
Ishii, O., Loeb, L., and Sun, Y. C. Intrauterine inoculation of acid-fast bacilli, 103
Ismet, A. Tuberculin reactivity increased by lipoids, 112
Iszard, M. S. Calcium and tuberculosis, 72
Iwansa, I. D. Treatment of tuberculosis with colloidal copper, 18

Jacobsthal, E. Demonstration of tubercle bacilli in suspected material, 123
Jakubowitsch, S., and Wariszezew, W. Complement fixation in tuberculosis, 129
Janet and Nobécourt. Tuberculous pericarditis, 138
von Jaski, G. K. Tuberculosis and syphilis, 51
Jellenigg, K. Infection from cough droplets most important, 71
——, ——. Spread of droplets by tuberculous children, 79
Jennings, F. B., Zinsser, H., and Ward, H K. Immunization with dead tubercle bacilli, 56
Jerusalem, M. Diagnosis of surgical tuberculosis, 140
Jesionek, A. Anatomic reactions to fractions of tubercle bacilli, 91
Jessen, H. Cystic bone tuberculosis, 142
——, ——. Treatment of pulmonary tuberculosis with sanocrysin, 162
Jews, Pulmonary tuberculosis among, 65
Jiwago, N. L., and Lubarski, W. A. Cellular reaction to tubercle bacillus, 91
Joint, shoulder, tuberculosis of, Baron's operation for, 142
—— tuberculosis, bone and, treatment of, X-ray, 141
—— ——, Diazo reaction in bone and, 137
—— ——, Origin and treatment of, 142
de Jong, S. I., and Christophe, J. Treatment of chronic pulmonary tuberculosis with iodine, 18
——, ——. ——., —— Martin, R. Tuberculin reactions and skin disease, 52
Jötten, K. W., Uhlenhuth, P., and Hailer, E. Disinfection of tuberculous sputum with parmetol, 58
Jouve and Delore, F. Paraplegia from cold abscess following Albee operation, 143
Jullien and Martin-Rosset. Blood cholesterin in tuberculosis, 99
Jungmann, P. Treatment of tuberculosis with tuberculin, 22
Junker, F. Red-cell sedimentation reaction, 133

Kalkbrenner. Leucocytes in prognosis of pulmonary tuberculosis, 59
Karfunkel's vaccine in tuberculosis, 24

Kayser-Petersen. Infectiousness of tuberculosis, 67
Kelemen, G. Diazo reaction in bone and joint tuberculosis, 135
——, ——. Toxic changes in surgical tuberculosis, 141
Keller, H. Origin and treatment of joint tuberculosus, 142
Kettner, A., and Halir, O. Blood and vegetative allergy, 102
Kime, J. W. New instrument for heliotherapy, 156
Kindberg, L. Sudden death following pleural puncture in artificial pneumothorax, 14
Kindwall, J. A., Cunningham, R. S., Sabin, F. R., and Sugiyama, S. Rôle of monocyte in tuberculosis, 92
Kirch, A. Tuberculous cachexia, 120
Kirchner, M. Tuberculosis among physicians and nurses, 73
Kirk, H. Tuberculous choroiditis in cat, 87
Kisch, E. Treatment of surgical tuberculosis, 141
Kisskalt, K., and Schütz, F. Effect of lead on experimental tuberculosis, 105
——, ——., —— ——, ——. Lead poisoning and tuberculosis, 73
Klare, K. D'Espine's sign, 122
Kleinschmidt, H. Hilum enlargements in children, 80
Klemperer, F. Treatment of tuberculosis with sanocrysin, 161
Klinckmann, E. Treatment of tuberculosis with ectebin, 24
Kline, B. S., and Berger, S. S. Treatment of spirochetal pulmonary gangrene with arsphenamine, 19
Klopstock, F. Chemotherapeutic experiments in tuberculosis of guinea pigs, 15
Klotz, M., and Sänger, E. Immunization of infants with dead tubercle bacilli, 57
Knotz, I. Thoracic pain in early tuberculosis, 119
Koch, F. Treatment of tuberculosis with sanocrysin, 162
Kogan, L. Fornet's diagnostic method, 134
——, ——. Tuberculosis mortality in Lithuania, 66
Koizumi, T. Treatment of experimental tuberculosis with krysolgan, 18
——, ——. Tubercle bacilli in bile, 107
Koontz, A. R. Congenital cysts of lung, 33
——, ——. ——. Experimental effects of war gases on lungs, 34
Korenchevsky, V. V. Emulsions of testes and adrenals in treatment of tuberculosis, 26
Kotzulla and Opitz. Effect of Moellgaard's serum in tuberculous animals, 162
v. Kovacz, F. Flocculation reaction in tuberculosis, 133
——, ——. Treatment of pulmonary tuberculosis with Boquet-Nègre antigen, 148
Kramer, S. E., and Grove, J. S. Primary carcinoma of lung, 48
Kromayer. Treatment of lupus vulgaris by ignipuncture, 145
Kruchen, C. Red-cell sedimentation and Daranyi reactions, 133
Krysolgan, Treatment of experimental tuberculosis with, 18
——, —— —— pulmonary tuberculosis with, 17, 18, 159
——, —— —— surgical tuberculosis in children with, 83
——, —— —— tuberculosis with, 18, 159
Kudlich, H. Primary tuberculosis of conjunctiva, 135
——, ——., Winternitz, F., and Ghon, A. Anatomy and genesis of tuberculosis in infants, 76
Kühn, A. Treatment of pulmonary tuberculosis by dry inhalation, 149
Kümmell, H., Jr. Tuberculous osteomyelitis of tibia, 143
Küss, G. Determination of pleural pressures in artificial pneumothorax, 9

Labry, Delore and Conte. Hemicolectomy in ileocecal tuberculosis, 140
Ladeck, E. Psychic fever reactions in tuberculosis, 119
Lambert, A. S., and Miller, J. A. Treatment of lung abscess, 41
Landau, W., and Glogauer, O. Blood sugar in pulmonary tuberculosis, 100
——, ——. Oils in X-ray diagnosis of bronchiectasis, 126

Landgraf, T. Exairesis of phrenic nerve in treatment of pulmonary tuberculosis, 155
Lang, F. J. Development of tubercles *in vitro*, 91
Lange, B. Dust infection most probable in tuberculosis, 71
——, ——. Route of tuberculous infection, 70
——, ——. Tuberculous infection by mouth, nose and conjunctiva, 70
Langle and Lesné. Tubercle bacilli in pharynx in infants, 76
Laryngeal and pleuritic pain, relief of, Alcoholic nerve injections for, 164
—— tuberculosis, Treatment of, 136
—— ——, —— ——, Light, 136
—— ——, —— —— pulmonary and, X-ray, 159
—— ——, —— ——, Surgical, 136
Lawson, J. D. Intrathoracic lymphadenopathy, 138
Lead, Effect of, on experimental tuberculosis, 105
—— poisoning and tuberculosis, 73
LeBlanc, E. Treatment of pulmonary tuberculosis with sanocrysin, 160
Leffler, J. Subacute apical nontuberculous pneumonia, 40
Leffmann, R., and Treu, R. Red-cell sedimentation reaction, 132
Leichtentritt, B. Diet in experimental tuberculosis, 105
Leimdörfer, A. New constituent of blood in tuberculosis, 100
Lelong, M., and Debré, R. Heredity in tuberculosis, 67
——, ——., Bernard, L., and Debré, R. Results of tuberculosis prophylaxis in young infants, 53
v. Lemesic, M., and Ignatowski, A. I. Secondary tuberculosis, 88
Lemmens, K. Diazo reaction in tuberculosis, 134
Lenk, R., and Haslinger, F. Lipiodol in pulmonary diagnosis, 126
Leprosy and tuberculosis, 51
Lesions of teats in tuberculin-reacting cows, 84
——, Pulmonary, simulating tuberculosis, 38
Lesné and Langle. Tubercle bacilli in pharynx in infants, 76
Leucocytes, Changes in, during tuberculin treatments, 116
——, Development of epithelioid cells from, 95
——, Fate of, in tuberculin reaction, 101
—— in allergic states, 101
—— —— prognosis of pulmonary tuberculosis, 59
—— —— pulmonary tuberculosis at high altitudes, 100
—— —— tuberculosis, 116
Leucocytosis in tuberculosis, High, 145
Leukemia and tuberculosis, 51
Lévy, R., Marie, J., and Armand-Delille, P. Artificial pneumothorax in pulmonary tuberculosis in childhood, 4
Lichenstein, S. Disinfection of tuberculous sputum with parmetol and alkalysol, 58
Liebman, C., and Carty, J. R. Empyema in children, 30
Light, Artificial, treatment, 157
——, Influence of, on growth of tubercle bacilli, 107
—— treatment of laryngeal tuberculosis, 136
——, Ultraviolet, for pleural fistula, 157
——, ——, in pulmonary tuberculosis, 156
Lime and silicic acid, Treatment of pulmonary tuberculosis by inhalation of carbon, 26
Limitations of X-ray diagnosis of pulmonary tuberculosis, 123
Lipase titre of serum of tuberculous children, 83
Lipatren treatment of surgical tuberculosis, 148
Lipiodol, Diagnostic value of, 125
—— for topographical diagnosis of pneumothorax, 125
—— in pulmonary diagnosis, 126
——, Intratracheal injections of, 126
Lipodieresis in lung, 97
Lipoid antibodies in tuberculosis, Fat and, 113
Lipoids in foci of pulmonary tuberculosis, Fats and, 96
——, Tuberculin reactivity increased by, 112
Lithuania, Tuberculosis mortality in, 66
Liver, Changes in, in tuberculosis elsewhere, 98

Liver, Fatty, of phthisis, 99
—— in tuberculosis, Chemical study of bile and, 99
——, Protein decomposition in, due to tuberculin, 112
Living tubercle bacilli, Immunization of children with, 55
—— —— —— necessary for practical immunization, 54
Lloyd, J. S. Suppression of tuberculous infection in cattle, 85
Local anesthesia, Vaginal hysterectomy under, in pulmonary tuberculosis, 163
Localized tuberculosis, Chronic, 89
Loeb, L., Sun, Y. C., and Ishii, O. Intrauterine inoculation of acid-fast bacilli, 103
Loewenstein, E. Avian tuberculosis in man, 70
Long, E. R., and Seibert, F. B. Tuberculin, 21
——, ——. ——. Standardization of tuberculin, 108
Long, P. H., and Bradley, J. I. Fate of leucocytes in tuberculin reaction, 101
——, ——. ——., —— Stewart, F. W. Leucocytes in allergic states, 101
Lord, F. T. Abscess of lung, 30
Lorey, A., and Gehrcke, A. X-ray treatment of pulmonary tuberculosis, 159
Low incidence of Ranke's primary complex, 87
Lubarski, W. A., and Jiwago, N. L. Cellular reaction to tubercle bacillus, 91
Lung, Abscess of, 30
—— ——, Treatment of, 41
——, carcinoma of, Primary, 48, 49
——, —— ——, upper-lobe, Diagnosis of, 49
——, collapse of, Therapeutic, 151
——, consolidation of, Acute, 29
——, cysts of, Congenital, 33
——, —— ——, hydatid, diagnosis of, X-ray, 33
——, foreign body nine years in, Aspirated, 45
——, hydatid cysts of, Treatment of, 34
——, Lipodieresis in, 97
——, malignant tumors of, Primary, 48
—— markings of normal dogs, 90
——, Pathological changes in, from mercurochrome, 21
Lung, Puncture of, in diagnosis, 121
——, tumors of, Metastatic, simulating acute respiratory disease, 50
Lungs, apices of, Percussion of, 122
—— collapsed by artificial pneumothorax, Evolution of tuberculosis in, 4
——, cystic disease of, Congenital, 33
——, effects of war gases on, Experimental, 34
Lupus of both hands, Pulmonary tuberculosis and, 144
—— —— nose and upper air passages, Treatment of, by radium, 157
——, Treatment of, with pyotropin, 144, 145
—— vulgaris, Treatment of, by ignipuncture, 145
Luze, O. High leucocytosis in tuberculosis, 145
Lydtin, K. Classification of pulmonary tuberculosis, 60
Lymph nodes, abdominal, Tuberculosis of, 81
—— ——, bronchial, Anthraco-chalicosis of, and bronchitis deformans, 46
—— —— in phthisis, regional, Specific changes in, 90
Lymphadenopathy, Intrathoracic, 138

Madlener, M. Sputum in various forms of pulmonary tuberculosis, 117
Maendl, H. Artificial pneumothorax in pulmonary tuberculosis, 3
——, ——. Injection of exudate as aid to artificial pneumothorax, 149
——, ——. Menstrual reaction in tuberculosis, 118
Magnesium and calcium in blood of tuberculosis patients, 100
Malaitre and Arloing. Sections through cultures on potato media, 107
Male, G. P. Milk and certified herds, 57
Malignant tumors of lung, Primary, 48
Malnutrition in children, Relation of tuberculosis to, 79
Man, Avian tuberculosis in, 70
Manges, W. F. Foreign bodies in trachea, 45
Marie, J., Armand-Delille, P., and Lévy, R. Artificial pneumothorax in pulmonary tuberculosis in childhood, 4
Markings, Lung, of normal dogs, 90

Marquis, W. J., and Moore, A. B. X-ray diagnosis of bronchiectasis, 30
——, ——. ——. Lung markings of normal dogs, 90
Marsh, H. Lesions of teats in tuberculin-reacting cows, 84
Martin, R., and de Jong, S. I. Tuberculin reactions and skin disease, 52
Martin-Rosset and Jullien. Blood cholesterin in tuberculosis, 99
Masking pulmonary tuberculosis, Alternating or substituted infections, 124
Massive pulmonary collapse, 44
Matefy reaction as guide of activity, 134
Matson, R. C., Matson, R. W., and Bisaillon, M. Artificial pneumothorax, 152
——, ——. ——., ——, ——. ——., ——, ——. Surgical treatment of pulmonary tuberculosis, 150
Matson, R. W., Matson, R. C., and Bisaillon, M. Artificial pneumothorax, 152
——, ——. ——., ——, ——. ——., ——, ——. Surgical treatment of pulmonary tuberculosis, 150
Maximow, A. A. Development of epithelioid cells from leucocytes, 95
Mayall, G. Tuberculosis of dog, 87
——, ——. Tuberculosis of pig, 86
Mayeur, F. Fluoroscopy in artificial pneumothorax, 11
McGuire, P. F., and White, S. A. Vital capacity in citizens' military training camp, 118
Measles, Red-cell sedimentation reaction during, 133
—— treated prophylactically by serum, and tuberculosis, 75
Media, potato, cultures on, Sections through, 107
Mediastinal pleurisy, tuberculous, Symptomatology of, 140
—— shadow, Displacement of, 115
Mediastinum, Emphysema of skin and, in pulmonary tuberculosis, 90
Meignant, P. Red-cell sedimentation reaction, 132
Meinicke, E. Improved X-ray technique in chest examination, 123
—— reaction for syphilis, 51
Melamet. Hemoptysis, 116
Ménard and Foubert. Ultraviolet light in pulmonary tuberculosis, 156
Meningitis, Tuberculous, following trauma, 144
——, ——, Healing of, 144
——, ——, simulating epidemic encephalitis, 144
Menstrual fever in tuberculosis, 118
—— reaction in tuberculosis, 118
Menstruation and tuberculosis, 117
Mercurochrome, Pathological changes in lung from, 21
Metallic salts, Effect of, on experimental tuberculosis, 163
Metastatic tumors of lung simulating acute respiratory disease, 50
Method, diagnostic, Fornet's, 134
—— of obtaining skiagrams in artificial pneumothorax, Simple, 10
——, Ponndorf's, Treatment of pulmonary tuberculosis with, 25
Methods, diagnostic, tuberculin, Different, 126
——, staining, Sputum, 124
Methylic antigen as adjuvant in treatment of tuberculosis, 147
Michailow, F. A. Reaction of eosinophiles to tuberculin in diagnosis of pulmonary tuberculosis, 127
Michailow, K. Complement fixation in diagnosis of tuberculous exudates, 130
Mikulowski, V. Difficulties in diagnosis of tuberculosis in infancy, 75
Miliary tuberculosis, acute, Acute disseminated bronchopneumonia simulating, 40
—— —— in infant twenty-eight days old, 76
Military training camp, citizens', Vital capacity in, 118
Milk and certified herds, 57
——, Bacillus-free, 58
——, Clean, 58
—— supply and control of tuberculosis, 58
—— ——, Bovine tuberculosis and, 86
——, Tuberculous, 69
——, ——, and children, 79
——, ——, Dangers of, 70
——, ——, Pasteurization of, 57
Miller, J. A., and Lambert, A. S. Treatment of lung abscess, 41

Miller, J. A. Early diagnosis of tuberculosis, 120
Miller, J. W. Light treatment of laryngeal tuberculosis, 136
Miller, W. S. Alveolar pores of pneumonia, 29
Minerals in dietetic treatment of tuberculosis, 146
Miners, coal, Ruhr, tuberculosis among, Pneumonokoniosis and, 72
Misgeld, J. Radical interruption of pregnancy in progressive pulmonary tuberculosis, 28
Mixed infection in guinea pigs, 87
Moellgaard's serum, Effect of, in tuberculous animals, 162
Möhrke, W., and Blumenburg, W. Bacteriolysis of tubercle bacilli, 107
Monceaux, R. Chemical study of bile and liver in tuberculosis, 99
Monocyte, Rôle of, in tuberculosis, 92
Monroe, R. T., and Emery, E. S., Jr. Value of X-ray of chest in tuberculosis suspects, 122
Moore, A. B., and Marquis, W. J. X-ray diagnosis of bronchiectasis, 30
Moore, J. Prevalence of bovine tuberculosis, 84
More accurate study of tuberculosis desirable, 62
Moreland, A. J. Treatment of hemoptysis with coagulen, 20
Morelli, J. B. Fibrosing pleurisy in artificial pneumothorax, 14
Mortality, Tuberculosis, 65
——, ——, in Germany, Recent increase of, 65
——, ——, —— Lithuania, 66
——, ——, —— Wiesbaden, 66
Mosczytz, N. Leucocytes in pulmonary tuberculosis at high altitudes, 100
Moses, H. M. Primary carcinoma of lung, 49
Mouchet. Sternocostoclavicular tuberculosis, 142
Mouth, nose and conjunctiva, Tuberculous infection by, 70
Mueller, H. C. Treatment of tuberculosis with ertuban, 25
Mueller, J. H. Active principles of tuberculin, 110
Mueller, J. H. Non-protein gum from tuberculin, 110
Müller, P. Effect of tuberculin injections on enuresis, 112
Mündel, F. Serodiagnosis of tuberculosis, 134
Munro, W. T., and Winchester, J. W. Chronic localized tuberculosis, 89
Muscular pain in pulmonary tuberculosis, 119
Mycotic infections of bronchi, 41

Nagel, V. Treatment of lupus with pyotropin, 144
Nakamura, N. Tuberculosis as etiological factor in otitis media, 135
Nattrass, F. J., and Patterson, D. W. Actinomycosis of pleura, 31
Necessary for practical immunization, Living tubercle bacilli, 54
Neild, N. Bronchial drainage by posture, 27
Nephrectomy, Suppuration of renal pelvis following, 143
Nerve injections, Alcoholic, for relief of laryngeal and pleuritic pain, 164
Nervous accidents during course of artificial pneumothorax, 153
Neumann, A. Treatment of tuberculosis with camphor, 21
Neumann, W. Diagnosis of upper-lobe carcinoma of lung, 49
New constituent of blood in tuberculosis, 100
—— defatted strain of tubercle bacillus for immunization, 57
—— disinfectant for sputum, Sputamin, 58
—— indications for prenicotomy, 156
—— instrument for heliotherapy, 156
Night sweats, Treatment of, with salvysat, 163
Nigoul-Foussal. Early signs of tuberculosis, 115
Nine years in lung, Aspirated foreign body, 45
Nobécourt and Janet. Tuberculous pericarditis, 138
—— —— Picnon, E. Ultraviolet light for pleural fistula, 157
Nomenclature, Tuberculosis, for dispensaries, 61

Nonopaque foreign bodies in bronchi, diagnosis of, X-ray, Underexposure in, 45
Non-protein gum from tuberculin, 110
Nontuberculous pneumonia, apical, Subacute, 40
—— pulmonary fibrosis, 31
Normal and tuberculous children, Demineralization coefficient in, 83
—— dogs, Lung markings of, 90
Norwood, V., and Bridgman, E. W. Pulmonary tuberculosis and pregnancy, 73
Nose and conjunctiva, Tuberculous infection by mouth, 70
—— —— upper air passages, lupus of, Treatment of, by radium, 157
Nurses, Tuberculosis among physicians and, 73

Oak-bark (cortalit), Treatment of pulmonary tuberculosis with, 21
Ogawa, T. Complement fixation in tuberculosis with antigens from acid-fast saprophytes, 105
Ohnawa, J., Arima, R., and Aoyama, K. New defatted strain of tubercle bacillus for immunization, 57
Oil, Intravenous injections of, in rabbit, 104
Oils in X-ray diagnosis of bronchiectasis, 126
Okell, C. C., *et. al.* Standardization of tuberculin, 110
Olbrechts, E., and Paquet, M. Deviations of esophagus in pulmonary tuberculosis, 114
Olner, D., and Raybaud, A. Thoracic and intrapleural respiratory tracings in artificial pneumothorax, 9
Ontario children, Tuberculosis survey of, 77
Operation, Albee, Paraplegia from cold abscess following, 143
——, Baron's, for tuberculosis of shoulder joint, 142
Opitz and Czerny. Treatment of tuberculosis in children with sanocrysin, 162
—— —— Kotzulla. Effect of Moellgaard's serum in tuberculous animals, 162
O'Reilly, W. F. Surgical posture in tonsillectomy, 34
Origin and treatment of joint tuberculosis, 142
Origin of phthisis of puberty, 67
Orlandi, N. Anthracotic tuberculous infiltrations of apex, 89
Osteomyelitis, Tuberculous, of tibia, 143
Otitis media, Tuberculosis as etiological factor in, 135
O'Toole, S. Testing range cattle with tuberculin, 84

Padel, G. Treatment of tuberculosis by increasing blood uric acid, 149
Pagel, W., and Pagel, M. Fats and lipoids in foci of pulmonary tuberculosis, 96
——, ——. Inflammation due to allergy, 111
——, ——. Phthisis of puberty, 84
Pain in pulmonary tuberculosis, 119
——, laryngeal and pleuritic, relief of, Alcoholic nerve injections for, 164
——, Muscular, in pulmonary tuberculosis, 119
——, Thoracic, in early tuberculosis, 119
Pallasse, E. Appraisal of artificial pneumothorax, 3
Pancoast, H. K., and Pendergrass, E. P. Pneumonokoniosis, 45
Papin. Renal tuberculosis in hemophiliac, 143
Paquet, M., and Olbrechts, E. Deviations of esophagus in pulmonary tuberculosis, 114
Paraplegia from cold abscess following Albee operation, 143
Parenchymal râles in pulmonary tuberculosis, 115
Parmetol and alkalysol, Disinfection of tuberculous sputum with, 58
——, Disinfection of tuberculous sputum with, 58
Parodi. Pressures in artificial pneumothorax, 8
Partial thoracoplasty in interlobar empyema, 44
Passini, F. Anaerobic growth of tubercle bacilli, 106
Pasteurization of tuberculous milk, 57
Pastor, J. R. Antituberculosis work in Porto Rico, 66
Patency and permeability of air passages in artificial pneumothorax, 5

Pathological changes in lung from mercurochrome, 21
Patients, professional care of, Tuberculosis following, 73
——, tuberculosis, blood of, Magnesium and calcium in, 100
——, ——, Contagiousness of, 67
——, ——, Psychology of, 119
Patterson, D. W., and Nattrass, F. J. Actinomycosis of pleura, 31
Pearson, S. V. End-results of artificial pneumothorax, 155
Pediatrics, Ultraviolet light treatment in, 157
Pelvis, renal, Suppuration of, following nephrectomy, 143
Pendergrass, E. P., and Pancoast, H. K. Pneumonokoniosis, 45
Percussion of apices of lungs, 122
Perforation, bronchopleural, Cure of, 140
Pericarditis, Tuberculous, 138
——, ——, Pericardotomy without drainage in, 138
Pericardotomy without drainage in tuberculous pericarditis, 138
Perlman, H. H., Cohen, L. S., and Bleckschmidt, J. Acute disseminated bronchopneumonia simulating acute miliary tuberculosis, 40
Permanent results of artificial pneumothorax, 155
Permeability of air passages in artificial pneumothorax, Patency and, 5
—— —— blood vessels, Increased, as cause of hemoptysis, 117
Perret, C. A., Pirquet, C. A., and Giraud, A. Exairesis of phrenic nerve in treatment of pulmonary tuberculosis, 1
Peters, E. Limitations of X-ray diagnosis of pulmonary tuberculosis, 123
Petri, T. Red-cell sedimentation reaction, 132
Petruschky, J. Conquest of tuberculosis, 66
Peyrer, R. Tricophytin and tuberculin, 112
Pharynx, Tubercle bacilli in, in infants, 76
Phlogetan, Treatment of tuberculosis with, 23
Phrenic nerve, accessory, Variations of, 156
—— ——, Exairesis of, 156
—— ——, —— ——, in treatment of pulmonary tuberculosis, 1, 155
Phrenicotomy, indications for, New, 156
Phthisiogenesis and prophylaxis of pulmonary tuberculosis, 54
Phthisis, Dissemination of cough droplets in, 71
——, Fatty liver of, 99
—— of puberty, 84
—— —— ——, Origin of, 67
——, regional lymph nodes in, Specific changes in, 90
Physical and psychic characteristics, Inherited, in tuberculosis, 69
Physicians and nurses, Tuberculosis among, 73
Pick, E., and Czyhrlarz, E. Percussion of apices of lungs, 122
——, ——., —— ——, ——. Puncture of lung in diagnosis, 121
——, ——. Emphysema of skin and mediastinum in pulmonary tuberculosis, 90
Picnon, E., and Nobécourt. Ultraviolet light for pleural fistula, 157
Piesbergen, W., and Bacmeister, A. Prognosis of pulmonary tuberculosis with cavity, 60
Pig, Tuberculosis of, 86
Pigs, Tubercle formation and skin reactions in, 86
Pilcher, J. D. Wheal formation in tuberculin-positive children, 82
Pirquet, C. A., Giraud, A., and Perret, C. A. Exairesis of phrenic nerve in treatment of pulmonary tuberculosis, 1
Pirquet-positive children, Weight of, 79
Pissavy, A. Pleurisy in artificial pneumothorax, 13
Play age, children of, Tuberculin reactions in, 78
Pleura, Actinomycosis of, 31
——, Calcification of, 33
Pleural callosities, Cartilaginous, at pulmonary apices, 89
—— effusions, Bacteriology of, in artificial pneumothorax, 154
—— fistula, Ultraviolet light for, 157
—— pressures in artificial pneumothorax, Determination of, 9
—— puncture in artificial pneumothorax, Sudden death following, 14
—— space, Pressure relations in, 99

Pleurisy, Fibrosing, in artificial pneumothorax, 14
—— in artificial pneumothorax, 12, 13
——, serous, Etiology of, 140
——, tuberculous mediastinal, Symptomatology of, 140
Pleuritic pain, relief of laryngeal and, Alcoholic nerve injections for, 164
Pneumonia, Alveolar pores of, 29
——, nontuberculous, apical, Subacute, 40
Pneumonokoniosis, 45
—— and tuberculosis among Ruhr coal miners, 72
——, Tuberculosis and, 36
Pneumothorax, Artificial, 152
——, ——, accidents of, Some rare, 13
——, ——, aid to, Injection of exudate as, 149
——, ——, Air embolism in, 154
——, ——, air passages in, Patency and permeability of, 5
——, ——, and "ventralization" in pregnancy complicated by pulmonary tuberculosis, 14
——, ——, Appraisal of, 3
——, ——, double, Successful, 4
——, ——, End-results of, 155
——, ——, effusions in, Prevention of, 13
——, ——, —— ——, Treatment of, 13
——, ——, Evolution of tuberculosis in lungs collapsed by, 4
——, ——, Fatal air embolism in, 14
——, ——, Fibrosing pleurisy in, 14
——, ——, Fluoroscopy in, 11
——, ——, in children, 82
——, ——, —— hemoptysis, 154
——, ——, —— pulmonary tuberculosis, 3
——, ——, —— —— —— in childhood, 4
——, ——, Indications and contraindications of, in pulmonary tuberculosis, 2
——, ——, Nervous accidents during course of, 153
——, ——, Permanent results of, 156
——, ——, pleural effusions in, Bacteriology of, 154
——, ——, —— pressures in, Determination of, 9
——, ——, Pleurisy in, 12, 13
——, ——, Pressures in, 8
——, ——, skiagrams in, Simple method of obtaining, 10
Pneumothorax, artificial, Sudden death following pleural puncture in, 14
——, ——, Thoracic and intrapleural respiratory tracings in, 9
——, ——, Tuberculosis antibodies and skin reaction during, 11
——, ——, Vital capacity in, 6
Pneumothorax, diagnosis of, topographical, Lipiodol for, 125
——, Fibrin clots in, 90
Pogniez, P., Corby, J., and Escallier. Tuberculous meningitis simulating epidemic encephalitis, 144
Pohl-Drasch, G. Importance of history in early diagnosis of pulmonary tuberculosis, 121
Poindecker, H. Sanatorium dietaries, 146
Poisoning, Lead, and tuberculosis, 73
Poix, G. Sanocrysin, 160
Pollet, Emile-Weil and Isch-Wall. Leukemia and tuberculosis, 51
Polymorphism of tubercle bacillus, 107
Ponndorf's method, Treatment of pulmonary tuberculosis with, 25
Popper, H., and Warkany, J. Synthesis of tyrosine and tryptophane by tubercle bacilli, 107
Popper, M. Red-cell sedimentation reaction, 130
Pores, Alveolar, of pneumonia, 29
Porto Rico, Antituberculosis work in, 66
Post-sanatorium care of tuberculosis, 146
Posture, Bronchial drainage by, 27
—— in tonsillectomy, Surgical, 38
Potato media, cultures on, Sections through, 107
Pottenger, F. M. Increased permeability of blood vessels as cause of hemoptysis, 117
——, ——. ——. Inherited physical and psychic characteristics in tuberculosis, 69
Practical immunization against tuberculosis impossible, 57
—— ——, Living tubercle bacilli necessary for, 54
Predisposition of child to tuberculosis, Inherited, 69
—— to apical tuberculosis, Anatomical, 69
Pregnancy, Interruption of, in tuberculosis, 27

Pregnancy, interruption of, Radical, in pulmonary tuberculosis, 28
——, Pulmonary tuberculosis and, 73
——, "ventralization" in, Artificial pneumothorax and, complicated by pulmonary tuberculosis, 14
Prenzel and Arnold. Tuberculosis in children, 76
Preponderance of right-sided apical pulmonary tuberculosis, Cause of, 89
Present status of tuberculosis in Germany, 65
Pressure relations in pleural space, 99
Pressures in artificial pneumothorax, 8
——, pleural, in artificial pneumothorax, Determination of, 9
Prevalence of bovine tuberculosis, 84
Prevention of effusions in artificial pneumothorax, 13
—— —— tuberculosis, 52
—— —— —— in infants, 53
Priestman, A. Hygienic and economic factors in tuberculosis among school children, 79
Primary and secondary pulmonary tuberculosis, Exudative infiltrations of, 89
—— carcinoma of lung, 48, 49
—— complex, 88
—— ——, Ranke's, Low incidence of, 87
—— malignant tumors of lung, 48
—— tuberculosis of conjunctiva, 135
Principles, Active, of tuberculin, 110
—— underlying village settlements, 147
Prisons of Prussia, Tuberculosis in, 65
Professional care of patients, Tuberculosis following, 73
Prognosis of pulmonary tuberculosis, Family history and, 59
—— —— —— ——, Leucocytes in, 59
—— —— —— —— with cavity, 60
—— —— scrofula, 135
—— —— tuberculosis, biological tests in, Value of, 58
——, Red-cell sedimentation reaction in, 59
Prophylaxis of pulmonary tuberculosis, Phthisiogenesis and, 54
——, tuberculosis, in young infants, Results of, 53
Protective inoculation of cattle, 85
—— —— —— —— with *BCG*, 85
Protein, blood, Effect of tuberculin on, 112
Protein decomposition in liver due to tuberculin, 112
Prussia, Tuberculosis in prisons of, 65
Psychic characteristics, Inherited physical and, in tuberculosis, 69
—— fever reactions in tuberculosis, 119
Psychology of tuberculosis patients, 119
Puberty, Phthisis of, 84
——, —— ——, Origin of, 67
Pulmonary and laryngeal tuberculosis, treatment of, X-ray, 159
—— apices, Cartilaginous pleural callosities at, 89
—— collapse, Massive, 44
—— diagnosis, Lipiodol in, 126
—— ——, Soft X-ray technique in, 123
—— fibrosis, Nontuberculous, 31
—— gangrene, Serotherapy and vaccinotherapy in, 37
—— ——, —— in, Intensive, 38
—— ——, spirochetal, Treatment of, with arsphenamine, 19
—— hemorrhage, experimental, Treatment of, with drugs, 16
—— lesions simulating tuberculosis, 38
—— reëxpansion in empyema, 43
Pulmonary tuberculosis, Alternating or substituted infections masking, 124
—— —— among Jews, 65
—— —— and lupus of both hands, 144
—— —— —— pregnancy, 73
—— ——, Ankylosis of spine in, 142
—— ——, Artificial pneumothorax and "ventralization" in pregnancy complicated by, 14
—— ——, —— —— in, 3
—— ——, —— —— ——, Indications and contraindications of, 2
—— —— at high altitudes, Leucocytes in, 100
—— ——, Blood sugar in, 100
—— ——, chronic, Treatment of, with iodine, 18
—— ——, Classification of, 60
—— ——, Deviations of esophagus in, 114
—— ——, Diagnosis of, 120
—— ——, —— —— activity in, 121
—— ——, —— ——, early, Importance of history in, 121
—— ——,—— ——, Reaction of eosinophiles to tuberculin in, 127

Pulmonary tuberculosis, diagnosis of, X-ray, Limitations of, 123
—— ——, Effect of spleen extract and bone-marrow on blood in, 27
—— ——, Effects of rainbearing winds on, 73
—— ——, Emphysema of skin and mediastinum in, 90
—— ——, Fats and lipoids in foci of, 96
—— ——, Healing of cavities in, 90
—— —— in childhood, Artificial pneumothorax in, 4
—— —— —— ——, symptoms of, Early, 80
—— ——, Infectiousness of saliva in, 71
—— ——, Pain in, 119
—— ——, —— ——, Muscular, 119
—— ——, Parenchymal râles in, 115
—— ——, Phthisiogenesis and prophylaxis of, 54
—— ——, primary and secondary, Exudative infiltrations of, 89
—— ——, prognosis of, Family history and, 59
—— ——, —— ——, Leucocytes in, 59
—— ——, —— ——, with cavity, 60
—— ——, Radical interruption of pregnancy in, 28
—— ——, right-sided apical, Cause of preponderance of, 89
—— ——, secondary infection in, X-ray of, 40
—— ——, Serum calcium in, 96
—— ——, Sputum in various forms of, 117
—— ——, Sulphurous thermal cure of, 149
—— ——, Treatment of, by dry inhalation, 149
—— ——, —— ——, —— inhalation of carbon, lime and silicic acid, 26
—— ——, —— ——, Exairesis of phrenic nerve in, 1, 155
—— ——, —— ——, Surgical, 150, 151
—— ——, —— ——, with Boquet-Nègre antigen, 148
—— ——, —— ——, —— camphor (hexeton), 20
—— ——, —— ——, —— doctojonan, 21
—— ——, —— ——, —— krysolgan, 17, 18, 159
—— ——, —— ——, —— oak-bark (cortalit), 21
Pulmonary tuberculosis, Treatment of, with Ponndorf's method, 25
—— ——, —— ——, —— sanocrysin, 16, 160, 162
—— ——, —— ——, —— triphal, 18
—— ——, —— ——, X-ray, 159
—— ——, Ultraviolet light in, 156
—— ——, Vaccines and bacteriotherapy in, 23
—— ——, Vaginal hysterectomy under local anesthesia in, 163
—— ——, with cavity in infants, 76
Puncture of lung in diagnosis, 121
——, pleural, in artificial pneumothorax, Sudden death following, 14
Pyopneumothorax, tuberculous, Treatment of, with iodine, 19
Pyotropin, Treatment of lupus with, 144, 145

Rabbit, Intravenous injections of oil in, 104
Rabbits, tuberculosis in, Spontaneous, 87
Rad, A. Displacement of mediastinal shadow, 115
Radical interruption of pregnancy in pulmonary tuberculosis, 28
Radium, Treatment of lupus of nose and upper air passages by, 157
Rainbearing winds, Effects of, on pulmonary tuberculosis, 73
Raffauf, C. J. Changes in leucocytes during tuberculin treatment, 116
Râles, Parenchymal, in pulmonary tuberculosis, 115
Range cattle, Testing, with tuberculin, 84
Ranke's primary complex, Low incidence of, 87
Rare accidents of artificial pneumothorax, Some, 13
Raw, N. Protective inoculation of cattle, 85
Raybaud, A., and Olner, D. Thoracic and intrapleural respiratory tracings in artificial pneumothorax, 9
Reaction, Cellular, to tubercle bacillus, 91
——, Daranyi, 133
——, Diazo, in bone and joint tuberculosis, 135
——, ——, —— tuberculosis, 134
——, Flocculation, in tuberculosis, 133
——, Matefy, as guide of activity, 134

Reaction, Meinicke, for syphilis, 51
——, Menstrual, in tuberculosis, 118
—— of eosinophiles to tuberculin in diagnosis of pulmonary tuberculosis, 127
——, Red-cell sedimentation, 128, 130, 131, 132, 133
——, —— ——, during measles, 133
——, —— ——, in prognosis, 59
——, skin, during artificial pneumothorax, Tuberculosis antibodies and, 11
——, tuberculin, Fate of leucocytes in, 101
——, ——, Specificity of, questioned, 127
——, ——, Time factors in, 127
Reactions, Anatomic, to fractions of tubercle bacilli, 91
——, ——, Psychic, in tuberculosis, 119
——, Red-cell sedimentation and Daranyi, 133
——, skin, in pigs, Tubercle formation and, 86
——, ——, Tuberculin, 126
——, ——, ——, in adult, 126
——, tuberculin, Cutaneous, 111
——, ——, in children of play age, 78
——, ——, —— skin disease, 52
Reactivity, Tuberculin, increased by lipoids, 112
Recent increase of tuberculosis mortality in Germany, 65
Rectum, Tuberculosis of, with urethrorectal fistula, 143
Red-cell sedimentation and Daranyi reactions, 133
—— —— reaction, 128, 130, 131, 132, 133
—— —— —— during measles, 133
—— —— —— in prognosis, 59
Redeker, F. Epidemiology of ambulant tuberculosis in children, 77
——, ——. Exudative infiltrations of primary and secondary pulmonary tuberculosis, 89
——, ——. Types of ambulant tuberculosis in children, 81
Reëxpansion in empyema, Pulmonary, 43
Regional lymph nodes in phthisis, Specific changes in, 90
Reinfection in tuberculosis, 71
Reisman, H. A. Relation of tuberculosis to malnutrition in children, 79
Relation of tuberculosis to malnutrition in children, 79
Relations, Pressure, in pleural space, 99
Relief of laryngeal and pleuritic pain, Alcoholic nerve injections for, 164
Renal pelvis, Suppuration of, following nephrectomy, 143
—— tuberculosis, Bilateral, 143
—— —— in hemophiliac, 143
—— —— treated conservatively, 143
Resistance to tuberculosis, acquired, Cancer and, 50
Respiratory disease, acute, Metastatic tumors of lung simulating, 50
—— distress after thoracoplasty, Severe, 155
—— exchange in experimental tuberculosis, 96
—— sequellae of war gases, 35
—— tracings in artificial pneumothorax, Thoracic and intrapleural, 9
Results of artificial pneumothorax, Permanent, 155
—— —— tuberculosis prophylaxis in young infants, 53
Reticulum, Formation of, in tubercles, 95
deReynier, L., and Giraud, A. Patency and permeability of air passages in artificial pneumothorax, 5
Rib, first, calcification of, Significance of, 114
Rieckenberg. Practical immunization against tuberculosis impossible, 57
Right-sided apical pulmonary tuberculosis, Cause of preponderance of, 89
Rist, E. Treatment of tuberculosis with sanocrysin, 17
Robertson, J. Tuberculous milk and children, 79
Rockwell, G. E., and Highberger, J. H. Carbon dioxide and growth of acid-fast bacilli, 104
Rodenacker. Tuberculosis in chemical industries, 72
——, G. Diagnosis of pulmonary tuberculosis, 120
Roger, G. H., and Binet, L. Lipodieresis in lung, 97
Rogers, L. Leprosy and tuberculosis, 51
Rôle of monocyte in tuberculosis, 92
Rolland. Evolution of tuberculosis in lungs collapsed by artificial pneumothorax, 4
Romich, S. Treatment of tuberculous abscesses, 135

Rosenstein, G., and Schmidtke, H. Serum calcium in pulmonary tuberculosis, 96
Roth, M. Partial thoracoplasty in interlobar empyema, 44
Roubier, C. Serotherapy and vaccinotherapy in pulmonary gangrene, 37
Route of tuberculous infection, 70
Rowe. Treatment of pulmonary tuberculosis with camphor (hexeton), 20
Rowlands, M. J. Tuberculosis and adequate diet for cattle, 85
Rowntree, L. G., and Brown, G. E. Tintometer for skin, 120
Ruediger, E. Pulmonary tuberculosis and lupus of both hands, 144
Ruhemann, E. Variations of accessory phrenic nerve, 156
Ruhr coal miners, tuberculosis among, Pneumonokoniosis and, 72
Rüscher, E. Irritation treatment of tuberculosis, 147

Sabin, F. R., Sugiyama, S., Kindwall, J. A., and Cunningham, R. S. Rôle of monocyte in tuberculosis, 92
Sachs, A., and Galatzer, N. Treatment of pulmonary tuberculosis with triphal, 18
Sahli, H. Tuberculin treatment, 22
Saliva, Infectiousness of, in pulmonary tuberculosis, 71
Salmon M., and Valtis, J. Red-cell sedimentation reaction, 131
——, ——., Baron, L., Valtis, J., and Bernard, L. Complement fixation in tuberculosis, 129
Salts, metallic, Effect of, on experimental tuberculosis, 163
Salvysat, Treatment of night sweats with, 163
Samson, J. W. Reinfection in tuberculosis, 71
Sanatoria, Segregation of cases in, 146
Sanatorium dietaries, 146
Sandgraf, T. Treatment of pulmonary tuberculosis with doctojonan, 21
Sänger, E., and Klotz, M. Immunization of infants with dead tubercle bacilli, 57
Sanocrysin, 160
——, Treatment of pulmonary tuberculosis with, 16, 160, 162
Sanocrysin, Treatment of tuberculosis in children with, 162
——, —— —— —— with, 16, 17, 161, 162
Sante, L. R. Acute consolidation of lung, 29
Santy. Tuberculosis of rectum with urethrorectal fistula, 143
Saprophytes, acid-fast, antigens from, Complement fixation in tuberculosis with, 105
——, ——, Cultivation of tubercle bacilli and, from sputum, 124
Sauerbruch, F., Herrmannsdorfer, A., and Gerson, M. Dietetic treatment of tuberculosis, 145
Schade, H. Significance of colds in tuberculosis, 37
Scheidemandel, F. Complement fixation in tuberculosis, 128
Schellenberg, G. Treatment of tuberculosis with krysolgan, 159
Schick, A. Pain in pulmonary tuberculosis, 119
Schiller, J. Cultivation of tubercle bacilli and acid-fast saprophytes from sputum, 124
Schilling, C. Tuberculin treatment of tuberculosis, 147
Schlapobersky, W. J. Changes in liver in tuberculosis elsewhere, 98
Schmid, F. Value of urochromogen test, 135
Schmidtke, H., and Rosenstein, G. Serum calcium in pulmonary tuberculosis, 96
Schmorl, G. Anthraco-chalicosis of bronchial lymph nodes and bronchitis deformans, 46
Schneider. Exercise for tuberculous children, 83
Schneider, A. Treatment of pulmonary tuberculosis with krysolgan, 159
Schneider, H. Treatment of lupus with pyotropin, 145
Schoen and Chalier. Tuberculous meningitis following trauma, 144
Schoenfeld, A. S., and Carpenter, C. M. Mixed infection in guinea pigs, 87
Schoenheit, E. M. Magnesium and calcium in blood of tuberculosis patients, 100
School age, tuberculous infection at, Frequency of 77

School children of Westphalia, Tuberculous infection in, 78
—— ——, tuberculosis among, Hygienic and economic factors in, 79
Schröder, G., and Deist, H. X-ray treatment of pulmonary and laryngeal tuberculosis, 159
Schulhof, E. Baron's operation for tuberculosis of shoulder joint, 142
Schulte-Tigges, H. Fat and lipoid antibodies in tuberculosis, 113
Schulz, E. Secondary stage of tuberculosis in adult, 88
Schürch, A. Exairesis of phrenic nerve, 156
Schütz, F., and Kisskalt, K. Effect of lead on experimental tuberculosis, 105
——, ——., —— ——, ——. Lead poisoning and tuberculosis, 73
Schwaitzar, V. Specific changes in regional lymph nodes in phthisis, 90
Scrofula and disease of teeth, 136
——, Prognosis of, 135
Scurfield, H. Bacillus-free milk, 58
Secondary infection in pulmonary tuberculosis, X-ray of, 40
—— pulmonary tuberculosis, Exudative infiltrations of primary and, 89
—— stage of tuberculosis in adult, 88
—— tuberculosis, 88
Sections through cultures on potato media, 107
Sedimentation reaction, Red-cell, 128, 130, 131, 132, 133
—— ——, ——, during measles, 133
—— ——, ——, in prognosis, 59
——, Red-cell, and Daranyi reactions, 133
Segregation of cases in sanatoria, 146
Seibert, F. B., and Long, E. R. Tuberculin, 21
Seiffert, G. Treatment of guinea-pig tuberculosis with specific vaccine, 26
Sell. Intellectual weapons in tuberculosis, 67
Selter, H. Immunization of children with living tubercle bacilli, 55
——, ——. Living tubercle bacilli necessary for practical immunization, 54
Senegalese troops, French, Tuberculosis among, 62
Sequellae of war gases, Respiratory, 35
Sergent, E., and Cottenot, P. Diagnostic value of lipiodol, 125
——, ——. Respiratory sequellae of war gases, 35
Serodiagnosis of tuberculosis, 134
Serological identity of human and bovine tubercle bacilli, 106
Serotherapy and vaccinotherapy in pulmonary gangrene, 37
—— in pulmonary gangrene, Intensive, 38
Serous pleurisy, Etiology of, 140
Serum calcium in pulmonary tuberculosis, 96
—— —— —— tuberculosis, 100
——, Measles treated prophylactically by, and tuberculosis, 75
——, Moellgaard's, Effect of, in tuberculous animals, 162
—— of tuberculous children, Lipase titre of, 83
Settlements, village, Principles underlying, 147
Severe respiratory distress after thoracoplasty, 155
—— tuberculous infection, Case of, 135
Shadow, mediastinal, Displacement of, 115
Sheep blood, Antibodies to, in tuberculosis, 113
Shoulder joint, tuberculosis of, Baron's operation for, 142
Siegert, F. Radical interruption of pregnancy in pulmonary tuberculosis, 28
Siegfried, K. Ankylosis of spine in pulmonary tuberculosis, 142
Siegl, J. Dissemination of cough droplets in phthisis, 71
Sign, D'Espine's, 122
Significance of calcification of first rib, 114
—— —— colds in tuberculosis, 37
Signs, Early, of tuberculosis, 115
Silberschmidt, P. Etiology of serous pleurisy, 140
Silberstein, S. Complement fixation in tuberculosis, 130
Silicic acid therapy, 163
—— ——, Treatment of pulmonary tuberculosis by inhalation of carbon, lime and, 26
Simon. Early symptoms of pulmonary tuberculosis in childhood, 80

Simple method of obtaining skiagrams in artificial pneumothorax, 10
Simulating acute miliary tuberculosis, Acute disseminated bronchopneumonia, 40
—— —— respiratory disease, Metastatic tumors of lung, 50
—— epidemic encephalitis, Tuberculous meningitis, 144
—— tuberculosis, Pulmonary lesions, 38
Singer, J. J., and Graham, E. A. X-ray study of bronchiectasis, 41
Skiagrams in artificial pneumothorax, Simple method of obtaining, 10
Skin disease, Tuberculin reactions in, 52
——, Emphysema of, and mediastinum in pulmonary tuberculosis, 90
—— reaction during artificial pneumothorax, Tuberculosis antibodies and, 11
—— reactions in pigs, Tubercle formation and, 86
—— ——, Tuberculin, 126
—— ——, ——, in adult, 126
——, Tintometer for, 120
Skutetzky, A. Matefy reaction as guide of activity, 134
Smirnow, G. Treatment of tuberculosis with artificial "antibodies," 26
Smith, S. Congenital cystic disease of lungs, 33
Smythe, A. M., and Dunham, E. C. Tuberculosis of abdominal lymph nodes, 81
Sobel, J., and Geiger, J. Disseminated tuberculosis in child, 82
Soft X-ray technique in pulmonary diagnosis, 123
Some rare accidents of artificial pneumothorax, 13
Somogyiesen, S. Menstruation and tuberculosis, 118
Sonnefeld, A., and Zadek, I. Surgical treatment of pulmonary tuberculosis, 151
Space, pleural, Pressure relations in, 99
Specific changes in regional lymph nodes in phthisis, 90
—— chemotherapy in tuberculosis, 15
—— vaccine, Treatment of guinea-pig tuberculosis with, 26
Specificity of tuberculin reaction questioned, 127
Spine, Ankylosis of, in pulmonary tuberculosis, 142
Spirochetal pulmonary gangrene, Treatment of, with arsphenamine, 19
Spirochetes in hemoptoic tuberculous sputum, 29
Spleen extract and bone-marrow, Effect of, on blood in pulmonary tuberculosis, 27
Spontaneous tuberculosis in rabbits, 87
Spread of droplets by tuberculous children, 79
Sputamin, new disinfectant for sputum, 58
Sputum, Cultivation of tubercle bacilli and acid-fast saprophytes from, 124
—— in various forms of pulmonary tuberculosis, 117
——, new disinfectant for, Sputamin, 58
—— staining methods, 124
——, tuberculous, Disinfection of, with parmetol, 58
——, ——, —— ——, —— —— and alkalysol, 58
——, ——, hemoptoic, Spirochetes in, 29
Stage, Secondary, of tuberculosis in adult, 88
Staining methods, Sputum, 124
Standardization of tuberculin, 108, 110
Status of tuberculosis in Germany, Present, 65
Staub, H., and Turban, K. Healing of cavity, 90
Stein, P. Treatment of tuberculosis with ektebin, 148
Stenger. Treatment of laryngeal tuberculosis, 136
Stern, E. Psychology of tuberculosis patients, 119
Sternocostoclavicular tuberculosis, 142
Stewart, F. W., and Long, P. H. Leucocytes in allergic states, 101
——, ——. ——. Focal tuberculin hypersensitiveness, 110
——, ——. ——. Tuberculous infection of testicle in guinea pigs, 104
Stovarsol for tuberculosis verrucosa cutis, 163
Strauss, W. Droplet or dust infection in tuberculosis, 70
Study of bronchiectasis, X-ray, 41
—— —— tuberculosis desirable, More accurate, 62

Stuhl, C. Treatment of pulmonary tuberculosis with krysolgan, 18
Subacute apical nontuberculous pneumonia, 40
Subin. Primary complex, 88
Substituted infections masking pulmonary tuberculosis, Alternating or, 124
Successful double artificial pneumothorax, 4
Sudden death following pleural puncture in artificial pneumothorax, 14
Sugar, Blood, in pulmonary tuberculosis, 100
Sugiyama, S., Kindwall, J. A., Cunningham, R. S., and Sabin, F. R. Rôle of monocyte in tuberculosis, 92
Sulphurous thermal cure of pulmonary tuberculosis, 149
Sun, Y. C., Ishii, O., and Loeb, L. Intrauterine inoculation of acid-fast bacilli, 103
Suppression of tuberculous infection in cattle, 85
Suppuration of renal pelvis following nephrectomy, 143
Surgical posture in tonsillectomy, 38
—— treatment of laryngeal tuberculosis, 136
—— —— —— pulmonary tuberculosis, 150, 151
—— tuberculosis, Diagnosis of, 140
—— ——, Treatment of, 141
—— ——, —— ——, in children with krysolgan, 83
—— ——, —— ——, Lipatren, 148
—— ——, Toxic changes in, 141
Suspects, tuberculosis, X-ray of chest in, Value of, 122
Survey, Tuberculosis, of Ontario children, 77
Sweany, H. C. Future of tuberculosis, 61
Sweats, night, Treatment of, with salvysat, 163
Swetlow, G. I. Alcoholic nerve injections for relief of laryngeal and pleuritic pain, 164
Sykes, K. A. H. Tubercle bacilli in feces, 124
Symptomatology of tuberculous mediastinal pleurisy, 140
Symptoms of pulmonary tuberculosis in childhood, Early, 80
Symptoms of tuberculosis in childhood, Early, 80
Synthesis of tyrosine and tryptophane by tubercle bacilli, 107
Syphilis, Meinicke reaction for, 51
——, Tuberculosis and, 51
Szirmai, F., and Venetianer, P. Complement fixation in tuberculosis, 130

Tamiya, T., and Zinsser, H. Antigenic substances in bacterial cells, 108
Tardieu, A., Grigaut, A., and Caussade, G. Intravenous injections of oil in rabbit, 104
Teats, Lesions of, in tuberculin-reacting cows, 84
Tebeprotin and ectebin, Treatment of tuberculosis with, 25
Technique of X-ray examination of apices, 123
——, X-ray, Improved, in chest examination, 123
——, ——, Soft, in pulmonary diagnosis, 123
Teeth, disease of, Scrofula and, 136
Teichman, O., and Wharry, H. M. Treatment of lupus of nose and upper air passages by radium, 157
Test, complement-fixation, Wassermann's, in cattle, 86
——, urochromogen, Value of, 135
Testes and adrenals in treatment of tuberculosis, Emulsions of, 26
Testicle, Tuberculous infection of, in guinea pigs, 104
Testing range cattle with tuberculin, 84
——, tuberculin, of cattle, Future of, 85
Tests, biological, in prognosis of tuberculosis, Value of, 58
——, Intracutaneous, with human and bovine tuberculin, 77
——, Tuberculin, on imported cattle in England, 84
Therapeutic collapse of lung, 151
Therapy, Silicic acid, 163
Therasse, G. Autopyotherapy in tuberculosis, 148
Thermal, Sulphurous, cure of pulmonary tuberculosis, 149
Thévenard. New indications for phrenicotomy, 156

Thiele, H. Tuberculosis in prisons of Prussia, 65
Tholuck, H. J. Scrofula and disease of teeth, 136
Thoracic and intrapleural respiratory tracings in artificial pneumothorax, 9
—— form and function in tuberculous children, 82
—— pain in early tuberculosis, 119
Thoracoplasty in interlobar empyema, Partial, 44
——, respiratory distress after, Severe, 155
Tibia, Tuberculous osteomyelitis of, 143
Time factors in tuberculin reaction, 127
Tintometer for skin, 120
Tissue extracts in tuberculosis, 102
Tomson, W. B. Danger of tuberculous infection, 67
Tonsillectomy, posture in, Surgical, 38
Topographical diagnosis of pneumothorax, Lipiodol for, 125
Torrence, H. L. Tuberculin tests on imported cattle in England, 84
Toxic changes in surgical tuberculosis, 141
Trachea, Foreign bodies in, 45
Tracings in artificial pneumothorax, Thoracic and intrapleural respiratory, 9
Training camp, military, citizens', Vital capacity in, 118
Trauma, Tuberculous meningitis following, 144
Trautmann, R. Treatment of surgical tuberculosis in children with krysolgan, 83
Treated conservatively, Renal tuberculosis, 143
Treatment, Dietetic, of tuberculosis, 145
——, ——, —— ——, Minerals in, 146
——, Irritation, of tuberculosis, 147
——, light, Artificial, 157
——, ——, of laryngeal tuberculosis, 136
—— of bone and joint tuberculosis, X-ray, 141
—— —— chronic bone tuberculosis, Etiology and, 141
—— —— —— cough in children, X-ray, 34
—— —— —— pulmonary tuberculosis with iodine, 18
—— —— effusions in artificial pneumothorax, 13
Treatment of experimental pulmonary hemorrhage with drugs, 16
—— —— —— tuberculosis with krysolgan, 18
—— —— guinea-pig tuberculosis with specific vaccine, 26
—— —— hemoptysis with coagulen, 20
—— —— hydatid cysts of lung, 34
—— —— joint tuberculosis, Origin and, 142
—— —— laryngeal tuberculosis, 136
—— —— —— ——, Light, 136
—— —— —— ——, Surgical, 136
—— —— lung abscess, 41
—— —— lupus of nose and upper air passages by radium, 157
—— —— —— vulgaris by ignipuncture, 145
—— —— —— with pyotropin, 144, 145
—— —— night sweats with salvysat, 163
Treatment of pulmonary tuberculosis by dry inhalation, 149
—— —— —— —— —— inhalation of carbon, lime and silicic acid, 26
—— —— —— ——, Exairesis of phrenic nerve in, 1, 155
—— —— —— ——, Surgical, 150, 151
—— —— —— —— with Boquet-Nègre antigen, 148
—— —— —— —— —— camphor (hexeton), 20
—— —— —— —— —— doctojonan, 21
—— —— —— —— —— krysolgan, 17, 18, 159
—— —— —— —— —— oak-bark (cortalit), 21
—— —— —— —— —— Ponndorf's method, 25
—— —— —— —— —— sanocrysin, 16, 160, 162
—— —— —— —— —— triphal, 18
—— —— —— ——, X-ray, 159
Treatment of spirochetal pulmonary gangrene with arsphenamine, 19
Treatment of surgical tuberculosis, 141
—— —— —— —— in children with krysolgan, 83
—— —— —— ——, Lipatren, 148
Treatment of tuberculosis, 145
—— —— —— by increasing blood uric acid, 149

Treatment of tuberculosis, Dietetic, 145
—— —— ——, ——, Minerals in, 146
—— —— —— in children with sanocrysin, 162
—— —— ——, Methylic antigen as adjuvant in, 147
—— —— ——, testes and adrenals in, Emulsions of, 26
—— —— ——, Tuberculin, 147
—— —— —— with artificial "antibodies," 26
—— —— —— —— camphor, 21
—— —— —— —— certain drugs, 17
—— —— —— —— colloidal copper, 18
—— —— —— —— drugs, 16
—— —— —— —— ectebin, 24, 148
—— —— —— —— ertuban, 25
—— —— —— —— krysolgan, 18, 159
—— —— —— —— phlogetan, 23
—— —— —— —— sanocrysin, 16, 17, 161, 162
—— —— —— —— tebeprotin and ectebin, 25
—— —— —— —— tuberculin, 22
Treatment of tuberculous abscesses, 135
—— —— —— pyopneumothorax with iodine, 19
Treatment, Surgical, of laryngeal tuberculosis, 136
——, ——, —— pulmonary tuberculosis, 150, 151
Treatment, Tuberculin, 22
——, ——, leucocytes during, Changes in, 116
——, ——, of tuberculosis, 147
Treatment, Ultraviolet light, in pediatrics, 157
Treatment, X-ray, of bone and joint tuberculosis, 141
——, ——, —— chronic cough in children, 34
——, ——, —— pulmonary and laryngeal tuberculosis, 159
——, ——, —— —— tuberculosis, 159
Treu, R., and Leffmann, R. Red-cell sedimentation reaction, 132
Tricophytin and tuberculin, 112
Triphal, Treatment of pulmonary tuberculosis with, 18
Troops, Senegalese, French, Tuberculosis among, 62
Tryptophane, Synthesis of tyrosine and, by tubercle bacilli, 107
Tubercle antigen, Dreyer's, and experimental tuberculosis, 23
Tubercle bacilli and acid-fast saprophytes, Cultivation of, from sputum, 124
—— ——, Bacteriolysis of, 107
—— ——, dead, Immunization of infants with, 57
—— ——, ——, —— with, 56
—— ——, Demonstration of, in suspected material, 123
—— ——, fractions of, Anatomic reactions to, 91
—— ——, growth of, Anaerobic, 106
—— ——, —— ——, Influence of light on, 107
—— ——, human and bovine, Serological identity of, 106
—— —— in bile, 107
—— —— —— feces, 124
—— —— —— pharynx in infants, 76
—— ——, living, Immunization of children with, 55
—— ——, ——, necessary for practical immunization, 54
—— ——, Synthesis of tyrosine and tryptophane by, 107
Tubercle bacillus, defatted strain of, New, for immunization, 57
—— ——, Polymorphism of, 107
—— ——, Viability of, 106
Tubercle formation and skin reactions in pigs, 86
Tubercles, Development of, *in vitro*, 91
——, Formation of reticulum in, 95
Tuberculin, 21
——, Active principles of, 110
—— diagnostic methods, Different, 126
——, Effect of, on blood protein, 112
——, —— ——, —— complement fixation, 128
——, human and bovine, Intracutaneous tests with, 77
—— hypersensitiveness, Focal, 110
—— injections, Effect of, on enuresis, 112
——, Intravenous injections of, 112
——, Non-protein gum from, 110
——, Protein decomposition in liver due to, 112

Tuberculin reaction, Fate of leucocytes in, 101
——, —— of eosinophiles to, in diagnosis of pulmonary tuberculosis, 127
—— ——, Specificity of, questioned, 127
—— ——, Time factors in, 127
—— reactions, Cutaneous, 111
—— —— in children of play age, 78
—— —— —— skin disease, 52
—— reactivity increased by lipoids, 112
—— skin reactions, 126
—— —— —— in adult, 126
——, Standardization of, 108, 110
—— testing of cattle, Future of, 85
—— tests on imported cattle in England, 84
—— treatment, 22
—— ——, leucocytes during, Changes in, 116
—— —— of tuberculosis, 147
——, —— —— —— with, 22
——, Tricophytin and, 112
Tuberculin-positive children, Wheal formation in, 82
Tuberculin-reacting cows, Lesions of teats in, 84
Tuberculosis, Ambard constant in, Value of, 130
—— among French Senegalese troops, 62
—— —— physicians and nurses, 73
—— —— Ruhr coal miners, Pneumonokoniosis and, 72
—— —— school children, Hygienic and economic factors in, 79
—— —— war veterans, 66
—— and adequate diet for cattle, 85
—— —— health insurance, 62
—— —— heart disease, 137
—— —— pneumonokoniosis, 36
—— —— syphilis, 51
—— antibodies and skin reaction during artificial pneumothorax, 11
——, —— to sheep blood in, 113
——, apical, Anatomical predisposition to, 69
——, as etiological factor in otitis media, 135
——, Autopyotherapy in, 148
——, Avian, in man, 70
——, bile and liver in, Chemical study of, 99
——, Blood cholesterin in, 99
——, —— in, New constituent of, 100
Tuberculosis, bone and joint, Diazo reaction in, 135
——, —— —— ——, treatment of, X-ray, 141
——, ——, chronic, Etiology and treatment of, 141
——, ——, Cystic, 142
——, Bovine, and milk supply, 86
——, ——, in Canada, 84
——, ——, —— United States, 84
——, ——, Prevalence of, 84
——, Calcium and, 72
——, Cancer and, 50
——, care of, Post-sanatorium, 146
——, chemotherapy in, Specific, 15
——, colds in, Significance of, 37
——, Complement fixation in, 128, 129, 130
——, —— —— ——, with antigens from acid-fast saprophytes, 105
——, Conquest of, 66
——, control of, Milk supply and, 58
——, diagnosis of, Early, 120
——, Diazo reaction in, 134
——, Disseminated, in child, 82
——, Droplet or dust infection in, 70
——, dust infection most probable in, 71
——, early, pain in, Thoracic, 119
——, —— signs of, 115
—— elsewhere, Changes in liver in, 98
——, Etiological factors in, 67
——, experimental, Diet in, 105
——, ——, Dreyer's antigen in, 24
——, ——, —— tubercle antigen and, 23
——, ——, Effect of lead on, 105
——, ——, —— —— metallic salts on, 163
——, ——, Respiratory exchange in, 96
——, ——, Treatment of, with krysolgan, 18
——, Fat and lipoid antibodies in, 113
——, fever reactions in, Psychic, 119
——, Flocculation reaction in, 133
—— following professional care of patients, 73
——, Future of, 61
——, guinea-pig, Treatment of, with specific vaccine, 26
——, Heredity in, 68
——, hilum, clinical, Diagnosis of, 139
——, ——, in children, Diagnosis of, 80
——, ileocecal, Hemicolectomy in, 140
—— in chemical industries, 72

Tuberculosis in childhood, 76
—— —— ——, symptoms of, Early, 80
—— —— children, 76
—— —— ——, ambulant, Epidemiology of, 77
—— —— ——, ——, Types of, 81
—— —— ——, Treatment of, with sanocrysin, 162
—— —— Germany, Present status of, 65
—— —— infancy, diagnosis of, Difficulties in, 75
—— —— infants, Anatomy and genesis of, 76
—— —— ——, Prevention of, 53
—— —— lungs collapsed by artificial pneumothorax, Evolution of, 4
—— —— prisons of Prussia, 65
—— —— rabbits, Spontaneous, 87
——, industrial, Factory ventilation and, 71
——, Infectiousness of, 67
——, Inherited physical and psychic characteristics in, 69
——, —— predisposition of child to, 69
——, Insulin in diabetes with, 52
——, Intellectual weapons in, 66
——, Interruption of pregnancy in, 27
——, joint, Origin and treatment of, 142
——, Karfunkel's vaccine in, 24
——, laryngeal, Treatment of, 136
——, ——, —— ——, Light, 136
——, ——, —— ——, Surgical, 136
——, Lead poisoning and, 73
——, Leprosy and, 51
——, Leucocytes in, 116
——, leucocytosis in, High, 145
——, Leukemia and, 51
——, localized, Chronic, 89
——, Measles treated prophylactically by serum, and, 75
——, Menstrual fever in, 118
——, —— reaction in, 118
——, Menstruation and, 117
——, miliary, acute, Acute disseminated bronchopneumonia simulating, 40
——, ——, in infant twenty-eight days old, 76
——, monocyte in, Rôle of, 92
——, More accurate study of, desirable, 62
—— mortality, 65
Tuberculosis mortality in Germany, Recent increase of, 65
—— —— —— Lithuania, 66
—— —— —— Wiesbaden, 66
—— nomenclature for dispensaries, 61
—— of abdominal lymph nodes, 81
—— —— aged, 62
—— —— conjunctiva, Primary, 135
—— —— dog, 87
—— —— epiglottis, 137
—— —— guinea pigs, Chemotherapeutic experiments in, 15
—— —— pig, 86
—— —— rectum with urethrorectal fistula, 143
—— —— shoulder joint, Baron's operation for, 142
—— patients, blood of, Magnesium and calcium in, 100
—— ——, Contagiousness of, 67
—— ——, Psychology of, 119
——, Practical immunization against, impossible, 57
——, Prevention of, 52
——, —— ——, in infants, 53
——, prognosis of, biological tests in, Value of, 58
—— prophylaxis in young infants, Results of, 53
Tuberculosis, pulmonary, Alternating or substituted infections masking, 124
——, ——, among Jews, 65
——, ——, and laryngeal, treatment of, X-ray, 159
——, ——, —— lupus of both hands, 144
——, ——, —— pregnancy, 73
——, ——, Ankylosis of spine in, 142
——, ——, Artificial pneumothorax and "ventralization" in pregnancy complicated by, 14
——, ——, —— —— in, 3
——, ——, —— —— ——, Indications and contraindications of, 2
——, ——, at high altitudes, Leucocytes in, 100
——, ——, Blood sugar in, 100
——, ——, chronic, Treatment of, with iodine, 18
——, ——, Classification of, 60
——, ——, Deviations of esophagus in, 114

Tuberculosis, pulmonary, Diagnosis of, 120
——, ——, —— —— activity in, 121
——, ——, —— ——, early, Importance of history in, 121
——, ——, —— ——, Reaction of eosinophiles to tuberculin in, 127
——, ——, —— ——, X-ray, Limitations of, 123
——, ——, Effect of spleen extract and bone-marrow on blood in, 27
——, ——, Effects of rainbearing winds on, 73
——, ——, Emphysema of skin and mediastinum in, 90
——, ——, Fats and lipoids in foci of, 96
——, ——, Healing of cavities in, 90
——, ——, in childhood, Artificial pneumothorax in, 4
——, ——, —— ——, symptoms of, Early, 80
——, ——, Infectiousness of saliva in, 71
——, —— lesions simulating, 38
——, ——, Pain in, 119
——, ——, —— ——, Muscular, 119
——, ——, Parenchymal râles in, 115
——, ——, Phthisiogenesis and prophylaxis of, 54
——, ——, primary and secondary, Exudative infiltrations of, 89
——, ——, prognosis of, Family history and, 59
——, ——, —— ——, Leucocytes in, 59
——, ——, —— ——, with cavity, 60
——, ——, Radical interruption of pregnancy in, 28
——, ——, right-sided apical, Cause of preponderance of, 89
——, ——, secondary infection in, X-ray of, 40
——, ——, Serum calcium in, 96
——, ——, Sputum in various forms of, 117
——, ——, Sulphurous thermal cure of, 149
——, ——, Treatment of, by dry inhalation, 149
——, ——, —— ——, —— inhalation of carbon, lime and silicic acid, 26
——, ——, —— ——, Exairesis of phrenic nerve in, 1, 155
——, ——, —— ——, Surgical, 150, 151
Tuberculosis, pulmonary, Treatment of, with Boquet-Nègre antigen, 148
——, ——, —— ——, —— camphor (hexeton), 20
——, ——, —— ——, —— doctojonan, 21
——, ——, —— ——, —— krysolgan, 17, 18, 159
——, ——, —— ——, —— oak-bark (cortalit), 21
——, ——, —— ——, —— Ponndorf's method, 25
——, ——, —— ——, —— sanocrysin, 16, 160, 162
——, ——, —— ——, —— triphal, 18
——, ——, —— ——, X-ray, 159
——, ——, Ultraviolet light in, 156
——, ——, Vaccines and bacteriotherapy in, 23
——, ——, Vaginal hysterectomy under local anesthesia in, 163
——, ——, with cavity in infants, 76
Tuberculosis, Reinfection in, 71
——, Relation of, to malnutrition in children, 79
——, renal, Bilateral, 143
——, ——, in hemophiliac, 143
——, ——, treated conservatively, 143
——, resistance to, acquired, Cancer and, 50
——, Secondary, 88
——, —— stage of, in adult, 88
——, Serodiagnosis of, 134
——, Serum calcium in, 100
——, Sternocostoclavicular, 142
——, surgical, Diagnosis of, 140
——, ——, Toxic changes in, 141
——, ——, Treatment of, 141
——, ——, —— ——, in children with krysolgan, 83
——, ——, —— ——, Lipatren, 148
—— survey of Ontario children, 77
—— suspects, X-ray of chest in, Value of, 122
——, Tissue extracts in, 102
Tuberculosis, Treatment of, 145
——, —— ——, by increasing blood uric acid, 149
——, —— ——, Dietetic, 145
——, —— ——, ——, Minerals in, 146
——, —— ——, Irritation, 147

Tuberculosis, treatment of, Methylic antigen as adjuvant in, 147
——, —— ——, testes and adrenals in, Emulsions of, 26
——, —— ——, Tuberculin, 147
——, —— ——, with artificial "antibodies," 26
——, —— ——, —— camphor, 21
——, —— ——, —— certain drugs, 17
——, —— ——, —— colloidal copper, 18
——, —— ——, —— drugs, 16
——, —— ——, —— ectebin, 24, 148
——, —— ——, —— ertuban, 25
——, —— ——, —— krysolgan, 18, 159
——, —— ——, —— phlogetan, 23
——, —— ——, —— sanocrysin, 16, 17, 161, 162
——, —— ——, —— tebeprotin and ectebin, 25
——, —— ——, —— tuberculin, 22
—— verrucosa cutis, Stovarsol for, 163
Tuberculous abscesses, Treatment of, 135
—— animals, Effect of Moellgaard's serum in, 162
—— cachexia, 120
—— children, Demineralization coefficient in normal and, 83
—— ——, Exercise for, 83
—— ——, serum of, Lipase titre of, 83
—— ——, Spread of droplets by, 79
—— ——, Thoracic form and function in, 82
—— choroiditis in cat, 87
—— exudates, diagnosis of, Complement fixation in, 130
—— infection at school age, Frequency of, 77
—— —— by mouth, nose and conjunctiva, 70
—— ——, Danger of, 67
—— —— in cattle, Suppression of, 85
—— —— —— school children of Westphalia, 78
—— —— of testicle in guinea pigs, 104
—— ——, Route of, 70
—— ——, severe, Case of, 135
—— infiltrations, Anthracotic, of apex, 89
—— mediastinal pleurisy, Symptomatology of, 140
—— meningitis following trauma, 144
—— ——, Healing of, 144
Tuberculous meningitis simulating epidemic encephalitis, 144
—— milk, 69
—— —— and children, 79
—— ——, Dangers of, 70
—— ——, Pasteurization of, 57
—— osteomyelitis of tibia, 143
—— pericarditis, 138
—— ——, Pericardotomy without drainage in, 138
—— pyopnemothorax, Treatment of, with iodine, 19
—— sputum, Disinfection of, with parmetol, 58
—— ——, —— ——, —— —— and alkalysol, 58
—— ——, hemoptoic, Spirochetes in, 29
——, Workshops for, 147
Tumors, Intrathoracic, 47
——, malignant, of lung, Primary, 48
—— of lung, Metastatic, simulating acute respiratory disease, 50
Turban, K., and Staub, H. Healing of cavity, 90
Twenty-eight days old, Miliary tuberculosis in infant, 76
Types of ambulant tuberculosis in children, 81
Tyrosine and tryptophane, Synthesis of, by tubercle bacilli, 107

Uhlenhuth, P., and Hailer, E. Sputamin, new disinfectant for sputum, 58
——, ——., Hailer, E., and Jötten, K. W. Disinfection of tuberculous sputum with parmetol, 58
Ultraviolet light for pleural fistula, 157
—— —— in pulmonary tuberculosis, 156
—— —— treatment in pediatrics, 157
Uncommon causes of hemoptysis, X-ray findings in, 28
Underexposure in X-ray diagnosis of non-opaque foreign bodies in bronchi, 45
Underlying village settlements, Principles, 147
United States, Bovine tuberculosis in, 84
Upper air passages, lupus of nose and, Treatment of, by radium, 157
Upper-lobe carcinoma of lung, Diagnosis of, 49

Urethrorectal fistula, Tuberculosis of rectum with, 143
Uric acid, blood, Treatment of tuberculosis by increasing, 149
Urochromogen test, Value of, 135

Vaccine, Karfunkel's, in tuberculosis, 24
—— of Calmette and Guérin, Immunization with, 55
——, specific, Treatment of guinea-pig tuberculosis with, 26
Vaccines and bacteriotherapy in pulmonary tuberculosis, 23
Vaccinotherapy in pulmonary gangrene, Serotherapy and, 37
Vaginal hysterectomy under local anesthesia in pulmonary tuberculosis, 163
Vallat, Hude and Chatellier. Tuberculosis of epiglottis, 137
Valtis, J., and Salmon, M. Red-cell sedimentation reaction, 131
——, ——., Bernard, L., Salmon, M., and Baron, L. Complement fixation in tuberculosis, 129
Value, Diagnostic, of lipiodol, 125
—— of Ambard constant in tuberculosis, 130
—— —— biological tests in prognosis of tuberculosis, 58
—— —— urochromogen test, 135
—— —— X-ray of chest in tuberculosis suspects, 122
Variations of accessory phrenic nerve, 156
Varrier-Jones, P. C. Principles underlying village settlements, 147
Vegetative allergy, Blood and, 102
—— —— in tuberculosis, 111
Vellaz and Dufour. Demineralization coefficient in normal and tuberculous children, 83
Venetianer, P., and Szirmai, F. Complement fixation in tuberculosis, 130
Ventilation, Factory, and industrial tuberculosis, 71
"Ventralization" in pregnancy, Artificial pneumothorax and, complicated by pulmonary tuberculosis, 14
Verrucosa cutis, tuberculosis, Stovarsol for, 163
Vessels, blood, permeability of, Increased, as cause of hemoptysis, 117
Veterans, war, Tuberculosis among, 66
Viability of tubercle bacillus, 106
Vierhaus, J., and Hecker, E. Lipase titre of serum of tuberculous children, 83
Vigneron, A., and Bezançon, F. Cutaneous tuberculin reactions, 111
——, ——., —— ——, ——. Tuberculin skin reactions in adult, 126
Village settlements, Principles underlying, 147
de la Villeon. Treatment of hydatid cysts of lung, 34
Vital capacity in artificial pneumothorax, 6
—— —— —— citizens' military training camp, 118
Volatile substances, Absorption and elimination of, 97

Wachter, R. Red-cell sedimentation reaction, 132
——, ——. Red-cell sedimentation reaction during measles, 133
Walbum, L. E. Effect of metallic salts on experimental tuberculosis, 163
Wallgren, A. Measles treated prophylactically by serum, and tuberculosis, 75
War gases, effects of, on lungs, Experimental, 34
—— ——, sequellae of, Respiratory, 35
—— veterans, Tuberculosis among, 66
Ward, H. K., Jennings, F. B., and Zinsser, H. Immunization with dead tubercle bacilli, 56
Wariszezew, W., and Jakubowitsch, S. Complement fixation in tuberculosis, 129
Warkany, J., and Popper, H. Synthesis of tyrosine and tryptophane by tubercle bacilli, 107
Warnecke. Prevention of effusions in artificial pneumothorax, 13
Wassermann's complement-fixation test in cattle, 86
Watkins, W. W. X-ray of secondary infection in pulmonary tuberculosis, 40
Weapons, Intellectual, in tuberculosis, 66
Weichsel, J. Red-cell sedimentation reaction, 131
Weidinger, E. Antituberculosis measures, 66
Weigeld, E. Red-cell sedimentation reaction, 132

Weigert, E., and v. Gutfeld, F. Complement fixation in tuberculosis, 129
Weight of Pirquet-positive children, 79
Weiss, M. Diazo reaction in tuberculosis, 134
——, ——. Treatment of tuberculosis with drugs, 16
Weissner, P. Muscular pain in pulmonary tuberculosis, 119
Weisz, A., and Fodor, E. Symptomatology of tuberculous mediastinal pleurisy, 140
Wendt, H. Wassermann's complement-fixation test in cattle, 86
Werner, I. Pulmonary tuberculosis among Jews, 65
Weskott, H. Insulin in diabetes with tuberculosis, 52
Westphalia, school children of, Tuberculous infection in, 78
Weygandt, T. Tuberculosis mortality in Wiesbaden, 66
Wharry, H. M., and Teichman, O. Treatment of lupus of nose and upper air passages by radium, 157
Wheal formation in tuberculin-positive children, 82
White, C. P. Cancer and tuberculosis, 50
White, R. G. Pasteurization of tuberculous milk, 57
White, S. A., and McGuire, P. F. Vital capacity in citizens' military training camp, 118
Wiese, O. Frequency of tuberculous infection at school age, 77
Williams, R. S. Clean milk, 58
Winchester, J. W., and Munro, W. T. Chronic localized tuberculosis, 89
Winds, rainbearing, Effects of, on pulmonary tuberculosis, 73
Winkler, A. Contagiousness of tuberculosis patients, 67
Winkler, U. Treatment of tuberculous pyopneumothorax with iodine, 19
Winslow, C.-E. A. Factory ventilation and industrial tuberculosis, 71
Winternitz, F., Ghon, A., and Kudlich, H. Anatomy and genesis of tuberculosis in infants, 76
Wolf, J. E. Tuberculosis antibodies and skin reaction during artificial pneumothorax, 11
Wolff, G., and Goldmann, F. Tuberculosis of aged, 62
Wolff-Eisner, A. Significance of calcification of first rib, 114
Workshops for tuberculous, 147

X-ray diagnosis of bronchiectasis, 30
—— —— —— ——, Oils in, 126
—— —— —— hydatid cysts of lung, 33
—— —— —— nonopaque foreign bodies in bronchi, Underexposure in, 45
—— —— —— pulmonary tuberculosis, Limitations of, 123
—— examination of apices, Technique of, 123
—— findings in uncommon causes of hemoptysis, 28
—— of chest, Value of, in tuberculosis suspects, 122
—— —— secondary infection in pulmonary tuberculosis, 40
—— study of bronchiectasis, 41
—— technique, Improved, in chest examination, 123
—— ——, Soft, in pulmonary diagnosis, 123
—— treatment of bone and joint tuberculosis, 141
—— —— —— chronic cough in children, 34
—— —— —— pulmonary and laryngeal tuberculosis, 159
—— —— —— —— tuberculosis, 159

Yasui, J. Treatment of experimental pulmonary hemorrhage with drugs, 16
Young, F. M. Calcification of pleura, 33
Young infants, tuberculosis prophylaxis in, Results of, 53

Zadek, I., and Sonnenfeld, A. Surgical treatment of pulmonary tuberculosis, 151
——, ——. Tuberculosis nomenclature for dispensaries, 61
Zeitschel, C. T. Anatomical predisposition to apical tuberculosis, 69

Zickgraf, G. Silicic acid therapy, 163
Ziegler. Artificial pneumothorax in hemoptysis, 154
Ziegler, O. Classification of pulmonary tuberculosis, 60
Zimmermann, W. Serum calcium in tuberculosis, 100
Zinsser, H., and Tamiya, T. Antigenic substances in bacterial cells, 108
——, ——., Ward, H. K., and Jennings, F. B. Immunization with dead tubercle bacilli, 56
Zwerg. Treatment of night sweats with salvysat, 163